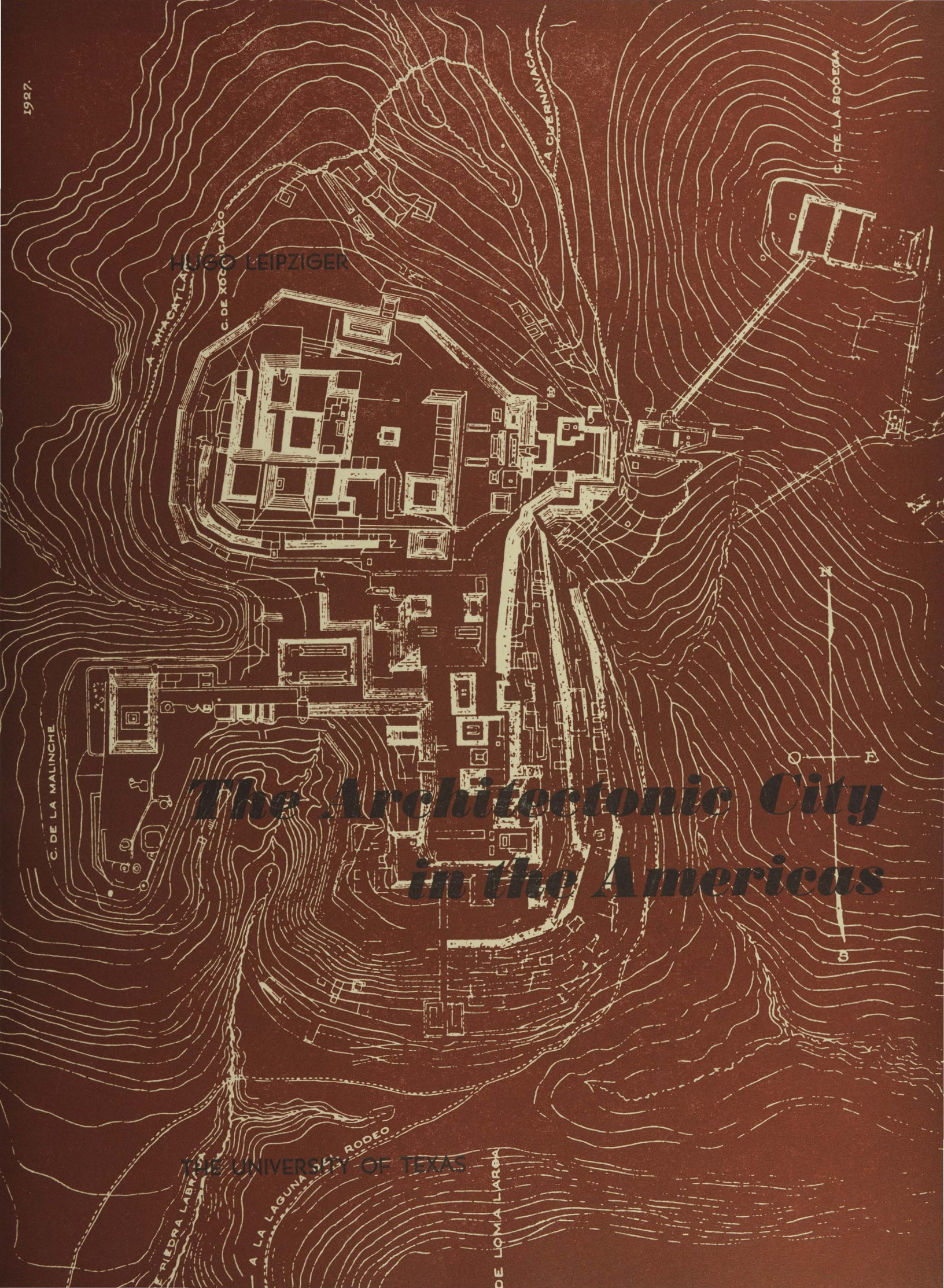

The Architectonic City in the Americas

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THE ARCHITECTONIC CITY IN THE AMERICAS

SIGNIFICANT FORMS, ORIGINS, AND PROSPECTS

By

HUGO LEIPZIGER

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FOREWORD

Near our international boundaries the traveler is usually impressed by the rapid change in community living as he steps from the soil of one country to another. Not only are the people and their habits much different, but the architecture and city plans are likewise of a different order.

In North America this is most marked as one crosses the Rio Grande. The architecture and community plans that prevail throughout North Texas show a strong Anglo-Saxon influence. Across the Rio Grande the architecture is definitely of Spanish and Mediterranean origin. In the South Texas area we see a most interesting blending of these two forms of construction with many elements of modern architecture.

To those who have given much study to the changing trends in past and modern architecture, there is a very definite feeling that the southern areas of the United States can well afford to take on many of their southern neighbors' excellent characteristics in the design of houses and communities. Furthermore, the climatic conditions of the southern latitudes of the United States will encourage a greater emphasis upon the desirability of adopting designs which afford the possibilities of better circulation, ventilation, sanitation, and construction of both home and commercial structures.

One of the problems which will confront the Americas as well as other countries as an aftermath to the present war is that of urban and rural rehabilitation and construction. During the present war there has been an extensive migration of our citizenry to temporary and congested living quarters.

A comprehensive and intelligent approach to community planning is considered of great importance in the upbuilding and rebuilding of our post-war cities. But such planning should not be a superficial improvision. There should be a sympathetic understanding on the part of the state or city as to the personal desires of citizens to be housed. Research and fact finding efforts must precede any orderly and economical developments which in turn must be coördinated with a general cultural policy.

Technology has developed new structural materials which will make possible a comparatively rapid transformation in town and country. But at the same time, these great technical achievements should be wisely utilized. It is the object of several professions to build up principles which are necessary for the success of this undertaking. The architectural profession is called upon to contribute its share as far as specific demands are concerned.

Latin-American countries, particularly Mexico, have a strong archaeological and historical heritage in common with Texas and the Southwest. While the archaeological part north of the Rio Grande Valley has become largely extinct, south of it literally thousands of villages have but little changed in a thousand years. From this condition, our historical knowledge should benefit by recognizing the origins of social and cultural trends in this area. But we must also take into consideration the more recent developments of intellectual achievement of the people from the United States and the Latin-American countries and incorporate the discoveries of modern industry into the designs that have withstood the rigors of centuries of trial.

In the national picture the State of Texas is strategically situated to nurture the anticipation that the modern community is to be rooted in regional as well as modern technological influences and needs. This study was undertaken as a partial fulfillment of such needs and demands, especially as contributed to the architectural characteristics in regional community planning. It will also help in establishing a foundation for an effective exchange and promotion of Inter-American relations.

Through the aid of the Latin-American Institute, the Bureau of Municipal Research, and the Division of Extension of The University of Texas, it has been made possible for Mr. Hugo Leipziger, member of the Faculty of the Department of Architecture of the College of Engineering, and member of the Bureau of Engineering Research, to bring together modern, Colonial, and pre-Columbian expressions of architecture and community planning. This publication is, furthermore, based upon Mr. Leipziger's professional background which includes a wide experience in Europe, the Orient, Australia and the United States.

This publication is presented as one of a series being published by The University of Texas on architecture and engineering planning.

The University of Texas
December, 1943

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ACKNOWLEDGMENTS

The problems of contemporary architecture are no longer of isolated interest to a small professional group, since a new civic-consciousness is focussing many communities' attention on the "Culture of Cities." In response to my last year's publication, *The City, the Housing and the Community Plan,* I have received numerous valuable suggestions and criticisms representing a wide scope of professional and lay reactions. These have helped me considerably in clarifying many problematical issues in the present writing.

Apart from such stimulating exchange of ideas there seems to be a growing public demand for the tabulation of practical suggestions instead of theoretical discussions. This attitude is quite justified in view of the necessity for counteracting promptly post-war problems by economic measures such as slum abolition, public works, or even the rebuilding of whole communities.

Yet there is also another approach of fundamental importance involved which, unfortunately, cannot be solved at a moment's notice. Short-cut methods will be of no avail as far as qualitative results are concerned. The following discussion is devoted, therefore, to the cultural factors of the architectonic city in the past and future. Excerpts have been presented as a paper to the Conference on Inter-American Intellectual Interchange, June 16 and 17, 1943, held at The University of Texas, Austin, Texas.

I wish to thank Dr. Charles W. Hackett, Professor of Latin-American History, Dr. Stuart A. MacCorkle, Professor of Government, Dr. J. O. Marberry, Professor of Educational Administration, Dean Thomas H. Shelby, of the Division of Extension, and Dean W. R. Woolrich of the College of Engineering for having made this publication possible.

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Austin, Texas H. L.
December, 1943

I ARCHITECTURE'S HISTORIC MISSION

"And the excellence or beauty or truth of every structure, animate or inanimate, and of every action of man, is relative to the use for which nature or the artist has intended them."—Plato, *Republic* X, 601.

I. Selection of Essential Phases

The Great Tradition of architecture has not only engraved itself upon the cities of innumerable civilizations but it can also be found in the form of written records. This development through the ages is characterized by common presuppositions and other elements which we may call philosophical, since they reach far beyond the sensible and phenomenal world.

Any adequate theory of architecture and city building should include the questions of origin and nature of developmental patterns. They are as important as structural and organizational characteristics. Only then will cities display again a significant unity of architectonic power and coherence, called by some an organic quality, when their builders have grasped the fundamental, spiritual, and philosophical issues of our time. Architecture has to deal with forms, shapes, and structures in space. But the material form becomes subordinate to the idea which is behind its functional and esthetic effects.

It is with the end of evolutionary progress in mind that this attempt is made to interpret forms and values of architectonic importance. Particularly the brilliant research work in archaeology has been assigned, as we shall see, to an important role in ascertaining and developing significant character in a new architecture.

Certain phases of past and recent architecture will be projected out of their chronological classification against the scale of intellectual and spiritual significance. In doing so, we follow Darwin's advice, "All observation must be for or against some view if it is to be of any service."

The basic requisite for the selection of such essential phases is that they must be endowed with a vigorous sense of reality. It is the imaginative application of this sense of reality to political affairs, science, and economics which has given world leadership to the Americas. It seems, therefore, no mere accident that at the same time cultural contributions of singular importance to architecture should have emanated from the American scene. Judging from certain indications, a new and vigorous architecture may well be destined to fulfill a similar mission as its great Gothic predecessor by transcending regional and racial boundaries. The significance of such a development must be viewed in the light of America's cultural role in a new world civilization.

America's accepted share of responsibility in the shaping of things to come is probably one of the most decisive developments in recent history. This task concerns itself not only with American-European problems but equally with those which arise from American-Oriental relations. The workable pattern of Inter-American intellectual exchange should become instrumental in the achievement of Oriental-Occidental cultural understanding, which is agreed to constitute the larger prerequisite for any lasting new order. As a manifestation and symbolic representation of contemporary socio-cultural trends, a significant architecture is not only of extraordinary importance for the Americas, but it also affords symbolic functions for the cultural coöperation of East and West.

The significance of architecture is conditioned and determined by a corresponding philosophical speculation. Therefore any interpretation of its symbolic forms is obliged to look for underlying social and cultural factors. In other words, the significant meaning of architectural symbolism must be derived from scientific data because they express the direction of thought involved. We can thereby easily establish the presence or lack of any genetic relationships between collected facts, which will permit us to gauge the internal and external worlds of experience involved as to their quality and true meaning.

We will have to restrict ourselves to a very few important phases of historic and contemporary architecture in order to steer our premises toward a general conclusion. I am fully aware that this will result in controversies since in the words of Jacob Burckhardt: "Looking at great periods we must be well aware of the more or less arbitrary value of the word greatness. . . . Any shrub looks rather big to an insect . . . provided the shrub is being noticed at all. Nevertheless we have to resign ourselves to this common attitude since there are no signs anywhere discernible which might give hope to a change from relative to absolute thinking. . . . In short we are running the risk of mistaking power for greatness."[1]

Furthermore, we will have to take into account the influence of specific cycles of "enlightenment." Time and again in history climactic waves of enlightenment have decided intellectual and spiritual issues through forging the emotional weapon of styles. From this we derive sufficient evidence to prove the existence of an inborn quality of architecture which disregards national, racial, or linguistic boundaries.

II. The Architecture of Colonial Cities

It seems to me that architectural achievements in the Americas can be analyzed as belonging, in a larger sense, to three groups of enlightenment: First, *European enlightenment* which so far has received the most scholastic attention; second, *American enlightenment* which Justino Fernandez calls a new artistic consciousness as "the source of American art."[2] To this I would like to add a third phase of rather symptomatic importance, *Oriental enlightenment.* I do not know of any research effort which has dealt with this matter as far as architecture is concerned.

While pre-Columbian development extends over a long period, the Colonial migrations were effected in a comparatively short time. This more or less abrupt transplantation of Medieval Europe to the northern and southern shores of America is responsible for one of the most striking features of this civilization: *an unprecedented independence from physical environment.* From the beginning, the European colonization proceeded at a pace of coherent and continued balance of accustomed mental and spiritual environments. Hence the corresponding resemblance to the motherland in Spanish and British early Colonial architecture. According to the law of mental gravity, a cultural conservatism was bound to yield only gradually to the imposing demands of a new physical environment.

There are, nevertheless, already at this early stage many indications of America's potentialities as a spiritual power in world events. It seems to me that conditions at the time of early American colonization by the Spanish and British share, despite all other materialistic differences, at least *one common denominator, spiritual motivation.*

In the North, "Puritan tradition was virtually prohibitive to the development of artistic expression." Yet early Colonial architecture of the seventeenth century built by "neighborly coöperation" is characterized as "dynamic" and as having had "a charm which was never recaptured in the formally designed houses of the Classic revival."[3] From the many instances of spiritual motivation in the British colonies of North America, it might suffice to point to

Cotton Mather whose *Magnalia Christi Americana* is counted among the masterpieces of English literature of the seventeenth century. At least it is said to have enjoyed more popularity than anything printed in Colonial New England despite its peculiar style. There are seven books in which Mather explained the "Protestant Reformation as a glorious climax in the adventurings of mankind and warmly believed that New England Congregationalism was the flower of the Reformation." He interpreted the history of early New England's settlements as pioneering in a "magnificent undertaking for the service of God," applying Protestant values to daily life procedures. In his introductory words to the *Magnalia* he says: "I write the wonders of the Christian religion, flying from the depravations of Europe to the American strand. . . . I relate the considerable matters that produced and attended the first settlement of colonies which have been renowned for the degree of Reformation, professed and attained by Evangelical Churches, erected in those ends of the earth. . . ."[4]

The same motivation of Christian spirituality produced a cultural pattern of distinct architectural expression in the different intellectual and geographical climates of the Spanish colonies. Vasco de Quiroga, the Bishop of Nichoacan, who came to Mexico in 1530, writes, "Europe has fallen into sin and we must raise the life of the Indians to a level of virtue and humanity superior to that of the European."[5] This endeavor reflected into the communal organization of missions and encomiendas. Cathedrals and city developments all over Latin America testify to the significant role which architecture acquired over mere building. Architecture, painting, and sculpture, fused with symbolism of pre-Columbian heritage, draw their exuberance from a spiritual conception of culture as an important expression of the growth of a new society built on Spanish foundations. *(Plates 1, 2, 3, 4, 5, 6.)*

III. Pre-Columbian Heritage

The countries of Mexico, Guatemala, Honduras, the highlands of the Andes, Peru, Bolivia, Ecuador, and Chile are crowded with the ruins of buried temples and cities. Every year new archaeological sites are added to the ones already known, most of which are not yet explored. For Mexico alone, it is estimated that on the average three hundred new sites are located annually. *(Plates 22, 23.)*

The Mayan First Empire is said to have been one of the world's most densely populated areas. Archaeological research has revealed the urban character of its settlements, and it is considered quite likely that this distributing

civilization originated in the dry highlands of Central Mexico from where it spread to the tropical low countries. The Mayas' extremely high material culture must be appraised as the result of their meditation upon the phenomena of space and time. Their mathematics, astronomy, hieroglyphic script, and architecture are documentary proof of their ability to link spiritual speculation with every day life processes. *(Plate 24, figs. 84, 85, 86, 87, 88.)*

One of the earliest recorded Maya dates, A.D. 68, leads us to the ruins of the city of Uaxactun in British Honduras which already at that time must have been fully developed. From this time on, an era of city building continued almost uninterruptedly. The Old Maya Empire constructed and abandoned a host of cities during the ensuing five centuries. All of them belong in the category of greatest architectural importance and impressiveness. For unknown reasons this period was followed by migrations after which a new wave of tremendous building activity developed. This happened throughout the peninsula of Yucatan, the home of the New Maya Empire until A.D. 1191 and to a lesser degree until A.D. 1450.

The predominate place among the capitals of the New Empire has been assigned to the city of Chichen Itza. This settlement had a dramatic history of repeated growth and decay beginning with A.D. 530 until the Toltec culture made it the foremost city in the New World. *(Plates 13, 14.)*

According to Spinden, the Mayan historic influence upon the American civilization can be compared with that of the Greeks in Europe.[6] It is assumed that the whole Xibalban tract of the Old Maya Empire developed somewhat in an area located between Comalcalco on the Gulf of Mexico, Uaxactun Tikal, and Copan, along and in the neighborhood of the Usamacinta Basin. It must have flourished over a span of a thousand years. *(Plates 9, 10, 11.)*

We gather from archaeological evidence that a highly developed artistic skill and knowledge was achieved which disappeared entirely but was fragmentarily resurrected in the still magnificent achievements of the Toltec, Aztec, and Yucatan-Maya. This is thought to have occurred as the consequence of catastrophes which overtook such great cities as Uaxactun, Copan, and Palenque and gave them back to jungle growth for fifteen hundred years. It is interesting to note that the city civilization of the Old Empire appeared as mysteriously as it disappeared. Among the theories of its origin is one which relates—though unfounded by evidence so far—the Xibalbans to the Mound Builders of the Mississippi.

The architectural achievement of grandiose civic and religious centers acquires even more significance if we consider the sporadic and short lived existence of these cities. While Uaxactun reached the age of one hundred

years, Palenque had sixty years of consecutive habitation; Quirigua, eighty-five years; Ixkun, thirty years; and Benque Viejo, only twenty years. *(Plates 8, 9, 10, 11, 12, 13, 14, 22, 23.)*

"The dense forests which immediately surround the Xibalban ruins at the present time are reëncroachments of jungle upon originally cleared spaces. In view of the amount of labour necessary to rear the great temple-complexes, Professor Morley calculates that the population of the Old Empire tract was at least five hundred times as great as at the present day. On the analogy of Chichen-Itza and other New Empire cities at the time of the Spanish Conquest, Copan and Palenque may each have numbered its citizens by the hundred thousand.

"To support such populations the presumed maize-plantations must have stretched for leagues around each city. Considering the number of those cities, and the certainty that still more will be discovered, picture the whole of the Usamacinta basin—to take only one region—as almost one vast garden at the height of the Old Empire's prosperity, with the forest lands reduced to narrow strips. Dr. Gann believes that some form of intensive cultivation was practiced in the neighborhood of the cities.

"With such-like aids of scattered fact and deduction an uncertain glimpse is obtained, through the darkness of fifteen centuries, of the flowering of a civilization at once childish and precociously mature."[7]

According to the Browditch-Joyce correlation, the first American civilizations began to disappear in A.D. 163, beginning with such cities as: Palenque, the "Old Empire Florence"; Copan, the great southern city; Piedras Negras in the north; Comalcalco in the extreme northwest; Yaxchilan far in the north; Ixkun in the south. All disappeared in short intervals from each other with the exception of Scibal and Tikal which followed in A.D. 340, forty years later, together with Benque Viejo and Flores. *(Plates 9, 10, 22, 23.)*

The spread of the Old Maya Empire is traced by archaeology to the Valley of Mexico via Oaxaca. But it also assumed that the Xibalban influence found its way into the pre-Inca domain. There is great uncertainty in regard to the thousand year history of Yucatan.

"In consequence of the curtailment of the ancient calendar, Yucatecan buildings lack the profuse datings of the Old Empire sites, with the result that Yucatecan tradition-history is almost entirely dateless but for the record of a single family-group—the Tutul Xiu, whose name suggests an un-Mayan origin and whose apparently meaningless wanderings across the antique Central American scene still induce almost as much confusion among Americanists as they probably did among the Xius' contemporaries."[8]

The New Empire cities of Chichen Itza and Tulum show dates of A.D. 350 and A.D. 300 in accordance with the Old Empire calendar. The invasion of the Toltec was followed by the abandonment of captured Chichen Itza as capital. In A.D. 989, Mayapan was built and became the administrative center of the League between Uxmal, Itzamal, and the reëstablished Chichen Itza.

The Yucatan League period is considered the height of New Empire art. Architectural landmarks at Chichen Itza (Casa Colorada, Caracol), Uxmal, Labna, Hochob, Kabah, and Chacmultun are placed in this period. Serpent columns, the Nahuan ball courts, vertical roof structures, and stone lattice-work on top of temple walls are considered typical of Mexican art and even related to Asiatic origin. The great pilgrimage road between Chichen Itza and the sea coast linked Cozumal, the island sanctuary, with all of Central America. It was here that priests saw the ships of approaching Portuguese in the year 1493.[9] *(Plates 11, 12, 13, 14.)*

The transitional phase between the Mayan and Toltec cultures is best illustrated by two outstanding archaeological sites near Oaxaca: Mitla, the "Zapotec town of the dead," and Monte Alban, a mountain fortress. Further proof is obtained from the Totonac pyramid of El Tajin (Vera Cruz) and the pyramid of Xochicalco near Mexico City. The pyramid of El Tajin with its four sides, seven tiers and 365 niches shows without doubt the application of astronomical accuracy. *(Plate 8.)*

The Toltecs built many storied buildings and pyramids. The pyramids of Cholula and Teotihuacan still bear witness to their great building ingenuity, although little other evidence is left of their palaces and temples in Mexico.

The decay of the city of Teotihuacan is placed toward the close of the sixth century A.D. while its culture continued after a renaissance, prior to the Aztecs, until the twelfth century. Although little is known of the history of this culture, the magnificent architecture of Teotihuacan is "one of the largest, and in many respects the most important, of the cities of ancient America."[10] *(Plate 7.)*

The original extension of Teotihuacan can hardly be determined. The actual archaeological site stretches over two hundred hectars, but other structural remains, which must have formed part of this city, are located outside this zone. Among such buildings is the ruin of Xolalpan, well-known for its fresco paintings.

The great ruins contain the Sun Pyramid, the Moon Pyramid, and the Ciudadela (Temple of Quetzalcoatl) enclosed by embankment walls. The broad road which leads from the Cuidadela along the Sun Pyramid to the Moon Pyramid also established the main axis of the city. Along it have been found remains of houses which were first mistaken for graves. As in the

case of El Tajin, Ciudadela contains in its three hundred sixty-six decorative head details as symbolization of the Mayan calendar for which the great pyramid of Chichen Itza has yielded a key in stone. *(Plate 7.)*

The crumbling Pyramid of Cholula is the greatest structure of ancient Mexico. Next after it comes the Sun Pyramid. The original shape of the pyramid which had been stone-plated is restored, although somewhat reduced in size. It has been estimated that the Sun Pyramid contains the volume of thirty-five million cubic feet with a weight of about three million tons, which is even surpassed by the pyramid of Cholula, constructed in the thirteenth century, with its approximate weight of ten million tons. In contrast to the restrictions for building areas like Monte Alban, the location of Teotihuacan permitted spacious planning against the panorama of the peak of Cerro Sordo. *(Plates 2, fig. 7; 7, figs. 20, 22.)*

The ancient Peruvian culture is largely identified with the Inca civilization. Here, as in the case of the Maya and Toltec, opposing schools of thought place remote origins to America, Asia, Europe, or Melanesia-Polynesia. The discovery of a true arch near Lima, otherwise unknown in pre-Columbian America, has added more speculation as did the stone discs found at Tiahuanaco near Lake Titicaca which are said to have taken the place of wheels in connection with building construction.

Granting certain stray influences from the East, the diffusion theory is generally discounted. The Peruvian achievements in astronomy, calendar, and sculpture are not comparable to those of the Mayas, but the stone cutting techniques, as displayed at Tiahuanaco and Macchu Picchu, are "unsurpassed throughout the American continent." At about the time that the great Maya civilization eclipsed in Central America, immense megalithic structures were erected in the Andes of Peru. Tiahuanaco, Macchu Picchu, Cuzco, Ollantaytambo, and two porphyr-towns near Masca were probably the administrative seats of densely populated regions. Tiahuanaco, "the metropolis of the hills," is believed to have contained gigantic statues, temples, and palaces for which trachyte blocks were used, skillfully cut and weighing several tons each. *(Plates 18, 19.)*

The main ruin at Tiahuanaco, twelve thousand feet above the sea on Lake Titicaca, is a huge flat-topped earth pyramid covering almost a square mile. Speculation has run high in determining the purpose of this magic structure which dominated the lake and the Sierra with its stone-faced terraces and stone houses. North of Cuzco are the ruins of an Inca city built on the narrow connecting link between two mountain peaks, Macchu Picchu and Huayna Picchu. The date of this ancient "hidden city" may belong to the

first or last Inca period. The extraordinary steep and dramatically beautiful location is about ten thousand feet above the sea level and four thousand feet above the Urubamba River. *(Plates 15, 16, 17.)*

Hiram Bingham[11] describes his discovery of the Old Inca Road which led finally to the hidden city and Macchu Picchu itself. This must have run between the citadel and all the major towns in this Inca region. From this we learn the unsurpassed skill of Inca road and highway building. In contrast to the custom of ancient Greece where roads had no stone pavement, not even in Athens, the Incas paved their streets and highways. Streets and market places in Alexandria and Milet are other examples while Priene showed some kind of hard pavement in the main streets where it was used for water drainage. The general rule of paving streets started only in Roman days. The same is true in regard to a systematic drainage system.

The Inca builders, having no pipes at their disposal, "conducted their small supply of precious water in very skillfully made stone conduits from one little reservoir to another. . . . The builders of Macchu Picchu were careful about drainage and guarded against the accumulation of ground water wherever it was not wanted."[12] The road leading to Macchu Picchu had to be built under the most adverse circumstances by cutting across cliffs and bridging precipices, sometimes utilizing natural tunnels. Gracefully curving along steep slopes the road was built with stone steps and wherever necessary supported by stone walls.

This Granite City or Citadel has been described by Bingham as one of the most formidably fortified settlements "perched on top of a steep ridge in the most inaccessible corner of the most inaccessible section of the Central Andes." He continues: "Since they had no iron or steel tools—only stone hammers and little bronze crowbars—its construction must have cost generations if not centuries of effort. To prevent their enemies from reaching their shrines, temples, and houses, they relied, first, on the rapids of the Urubamba which are dangerous even in the dry season and absolutely impassable during at least half of the year. On three sides this was their outer line of defense. On the fourth side the massif of Macchu Picchu Mountain is accessible from the plateau only by a narrow razor-like ridge less than forty feet across and flanked by precipices. Here they constructed a strong little fort—a veritable Thermopylae."[13] *(Plates 15, 16, 17.)*

Each of Macchu Picchu's clan groups occupied a row of several houses. "Since the citadel stood on a side hill, nearly all the houses were built on terraces, with their doors facing the hill, thus admitting but little light to the interior. As a consequence, and particularly where the outer wall of the house was flush with the retaining wall of the terrace, two or three small windows

lighted up the interior and gave a pleasant outlook over the Grand Canyon."[14] They were connected by a system of over one hundred stairways and narrow streets, leading to different terraces. *(Plate 15.)*

The principal temple is constructed of white granite blocks like all other buildings and opens according to Bingham "to the Sacred Plaza on the south and is enclosed on the other three sides by walls, twelve feet high, of remarkably beautiful construction. The lower tier of stones contains five gigantic blocks weighing several tons apiece; the three largest measure 13.2 feet, 10.2 feet, and 9.6 feet in length, respectively, each one is higher than a man and nearly three feet thick." The superbness of the Inca craftsmanship is furthermore illustrated in this temple construction by the fact that "the entire east wall appears to have settled nearly a foot, carrying with it a part of the north wall. It is not strange that this settling should have taken place, for the wall appears to have only a dirt foundation. So perfectly keyed together was it, however, that it has settled as a mass without disturbing the arrangement of the stones except at the corner."[15] *(Plates 18, 24, fig. 87.)*

Another item must be mentioned because it is "perhaps the most marked peculiarity of this ruin, whether it be temple or palace, . . . the ends of both the east and west sides are not perpendicular; nor do they have the customary inward slope characteristic of nearly all ancient Peruvian structures." The interesting structure "would have permitted the interior of this temple to have been constantly exposed to the sun while at the same time it was screened off from the view of anyone in the Sacred Plaza." The Temple of the Three Windows is said to give "better than anything else a clue to the mystery of the citadel." The only structure of its kind in Peru has three "conspicuously large windows" cut into a frame wall for purely ceremonial purposes. It overlooks the amphitheater and surveying beyond it the magnificent panorama of forest clad mountains—one of the finest panoramas in Peru.[16] *(Plates 17, 24, figs. 87, 88.)*

The ruins of the Fortress of Ollantaytambo are among the most striking pre-Columbian documents in South America. The outstanding feature of the Fortress consists of six reddish granite blocks with narrow interstices fitted between them called the "Six Monoliths." Opposite the fortress are the so-called "Schools." Apart from its Inca buildings this megalithic structure is of unknown age. It was almost impregnable and guarded the Urubamba Valley with its extensive agriculture on large terraces which are still cultivated today. *(Plates 18, fig. 70; 20, fig. 75.)*

The Pisco like the Urubamba Valley is an ancient center of cultivation. Highly efficient irrigation systems can be found throughout this region which is most clearly observed from the air. A typical pattern of canals, dams, and

fields reveals a gigantic irrigation system in the Pisco Valley which points to the existence of a highly developed culture. Nearby are the "Pock Marks" which resemble excavated graves. They follow as a "strip of bowl-like depressions along the backbone of a rocky ridge." As in the case of the irrigation system the explorers could not ascertain by plane the exact circumstances of these "Pock Marks."[17] *(Plate 21, figs. 80, 81.)*

Sacsahuaman is another fortress near ancient Cuzco. It is also of megalithic origin and was built with most remarkable architectural and engineering skill, blending with a magnificent panorama. The "Bowls" constitute another mystery for the archaeologist. They consist of a group of circular terrace structures, also near Cuzco, their purposes unknown but they might have been used as sunken gardens or amphitheaters. Near the seacoast of Peru are the remains of Chan-Chan, ancient capital of the Chimus. Little is left of the once mighty central palaces, sunken gardens, pyramids, and houses enclosed by huge walls which protected a population of two hundred fifty thousand.[18] *(Plates 19, figs. 71, 72; 21, figs. 78, 79.)*

The Great Wall of Peru was probably built by the Chimus as protection against the Incas. Robert Shippee[19] has followed its extension by plane for over forty miles but he believes that this constitutes only a small portion of its length. Like the Chinese Wall it is a masterpiece of construction which is strengthened by fourteen flanking fortresses. La Fortaleza at Paramonga has best remained intact among the Chimu structures. It is another masterpiece of ancient architectural engineering for the defense of the southern frontier. The Great Wall of Peru is located between La Fortaleza and Chan-Chan. It seems most likely that the Great Wall constituted a second defense line against the Incas. *(Plates 20, fig. 76; 21, fig. 77.)*

Architectural achievements of the Mayan, Inca, Aztec, and Toltec are so impressive, even in their present form of partial decay, that great inspiration and knowledge can be derived from them for the benefit of regaining the lost principles of a creative architecture. The Mayan civilization has been called by some observers the highest civilization ever attained. Another school of thought attributes this title to the ancient Andean civilization of the Incas in the South.

We know through extensive archaeological research about the process of blending between earlier cultures like those of Mesopotamia and the Indus Valley. But our knowledge of this continent is still too rudimentary to permit final conclusions in regard to the beginnings and the degree of blending between the Mexican, Mayan, and Peruvian cultures. We are speaking of certain peaks in the development of those civilizations and we are also aware

of geographical factors which have permitted pre-Columbian man to develop and utilize his energies to the highest degree.

The Inca empire with its ancient capital, Cuzco, developed to the height of its culture in the Andean highland zones eleven thousand feet above sea level. The advantageous physical circumstances of the Urubamba and Cuzco Valleys, and also the Titicaca Basin and the dry and desert-like coast of Peru, provided the background against which human ingenuity has shaped one of its finest civilizations. There we find the prerequisites of climatic conditions and raw materials necessary for such a success.

But these factors are not sufficient in themselves to explain the high degree of cultural quality of the Inca or, as we have seen before, the Mayan tradition. We must confess that we find ourselves at a crucial point and without any satisfactory answer. It is a question which depends on our growing faculty to understand and correlate the deeper roots of life. The complex problem remains still in the category of "unknown quantities."

IV. Universal Correspondence between Cultural Change and Architecture

The dynamic tendency of Egyptian linearity is still noticeable in Greek architecture despite its general adherence to the three dimensional sculptural conception of the human figure. But esthetic space formulation in Greece is extended to agora, temple, monument, and public building in a correlating capacity between those elements on one hand and their natural environment on the other. The new symbolic function was projected into the larger spatial order of the *civic center.* Yet, acropolis, agora, temples, civic buildings, and broad ceremonial avenues, as civic focal points, became the sole objectives of city planning still neglecting the residential quarters. These same principles were also applied in the pre-Columbian case.

The Medieval town changed part of this approach by shifting the emphasis away from the esthetic relationship of different civic centers and their natural environment to the *interior* space formulation of the Gothic church and that of the public and cathedral square. Church, town-hall, and guild-hall constituted the most important elements in this new space experiment. The Medieval town more or less united the scattered civic functions of the Greek city into the market place and the cathedral square. The Renaissance reiterated the Greek ideal mixing with it new elements of the intermediate Byzantine-Romanesque period. Finally the Baroque made the last successful attempt to

utilize esthetic potentialities of architectural form to express its social organization.

Sorokin's theory of cultural change takes into consideration all phases of science, art, and modes of conduct.[20] Regarding our present situation, he derives from his elaborate scheme the interesting assumption of a general decline of materialism in favor of a more idealistic outlook upon world affairs. Sorokin distinguishes between meaning and value of *ideational* and sensate or *visual* architecture and art with a well balanced *idealistic* phase between them. He depicts the history of art as constantly moving between the two extremes, changing values with each move. The third, the idealistic stage, lies between the ideational and sensate form and is achieved only on rare occasions. So far, according to Sorokin, it has only happened twice in the history of Western civilization—during Classic Greek and Medieval Gothic. Will it happen again? By applying this theory to pre-Columbian and Oriental art and architecture we can distinguish corresponding phases.

Ideational architecture, like painting or sculpture, is primarily concerned with an "inner content" treating all visual aspects as a symbolic expression of it. *Visual* architecture carries its meaning into visual effects. It is bare of symbolism and is only concerned with the fulfillment of utilitarian needs.

Ideational architecture serving transcendental purposes uses unpretentious and simple forms. It displays a "strong atmosphere of independence from its empirical surroundings." Beauty, the "inner content" is equivalent with harmony and inner richness which is in strong contrast to an exterior simplicity. *Visual* architecture displays dynamic principles by using decorations for external ornateness without consideration of structural functions. Visual architecture is "catching in stone or steel or wood the passing glimpses of phenomena."[21]

Fifth century Greek and thirteenth century Gothic are cited as examples of idealistic performance in Western civilization. Other phases like Baroque are termed excessively visual, brilliant, and sumptuous, devoid of any symbolism. Revivals, eclectic mixtures, Romanticism, and Classicism can be classified in some corresponding way.

V. Formality, the Ceremonial Tradition of Architecture in Occident and Orient

We can rely in the case of Greek city planning on theoretical records. But without the efforts of archaeology, our ideas of this period would have been rather vague. The so-called Hippodamic city layout is considered the most

characteristic step in the development of the second phase of Greek city planning which began during the fifth century. The development of the Greek city from the eighth century on is not yet fully explored, but certain Oriental influences are anticipated.

So far no actual confirmation of this assumption has been obtained since excavations of Phoenician-Syrian and Mesopotamian sites, including Babylon, have given no evidence of established principles for straight and rectangular street arrangements. The only exception to this rule in Asia Minor has been found in Milet, Hippodamus' native city. According to F. Haverfield,[22] the Oriental origin of the Greek city layout can be traced to the axial use of broad procession streets as they are found all through the Orient. *(Plates 25, 27, figs. 101, 102.)*

It is uncertain whether Hippodamus was called from Milet to Athens as an authority. In any event, Piraeus, the harbor of Athens, was remodelled according to his plans and became the starting point for the typical scheme to which all Greek city planning adhered from the fifth century on. The cleavage between Athens and its modern port, Piraeus, in regard to progressiveness is shared by all the older mother cities because they retained the irregular layout. The chronicler speaks of their backwardness. *(Plates 25, fig. 95; 26, figs. 96, 97, 98.)*

The case of Hippodamus can be used to advantage in pointing out the wearisome process by which principles of city planning evolve from prevailing cultural conceptions. The most characteristic distinction between the later Greek city and its predecessor is its rectangular and parallel street pattern. Although we cannot say that Hippodamus is its actual originator, he nevertheless is responsible for its general acceptance.

Plato refers to the disposition of the city plan, which in the fourth century, is equivalent to Hippodamic principles. But his remarks are primarily restricted to the general location of cities in mountainous terrain. What he has to say about the arrangement of public buildings and places can be equally applied to *symmetrical* as well as *asymmetrical* layouts.

Aristotle is in favor of the symmetrical scheme for all representative city quarters, with residential sections left to an accidental or unplanned procedure. This also was considered advantageous for defense purposes. According to Gerkan,[23] it is most unlikely that this interpretation of city planning devices is correct since the idea of confusing an invading enemy who is already inside the city fortifications would be of little psychological or real value. This explanation also seems logical when applied to the Medieval case.

According to Hippocrates and other medical authorities of his time, the symmetrical city with rectangular blocks and corresponding streets should

be oriented in accordance with the best possible sun radiation and wind exposure. This refers mainly to cities in the plains where symmetry is considered best, while the unsymmetrical solution is preferred in mountainous terrain. All these considerations doubtlessly influenced the theoretical as well as practical efforts of Hippodamus, but there is little evidence that a systematic attempt was ever made in ancient Greece to deal with the matter of city planning in the modern comprehensive sense.

The public square has always been a life necessity in city affairs irrespective of any particular country. It constitutes one of the most important problems in Greek city planning. The market is usually in the center of the city. It is a separate square, not just a broadening of the main street, which is accessible from the street. The market or agora represents an endorsed space, similar in shape to a horseshoe. All other public buildings play but a subordinate role in the disposition of the city layout because they permit almost unlimited possibilities of arrangement.[24] *(Plates 27, 28, 29.)*

The classic conception of the reciprocal relationship between function and beauty realizes well the important principle of organic growth besides that of symbolic planning. The principles, furthermore, include planned as well as unplanned activities as we have seen. With the advent of city planning reform during the fifth century, the contrast between the older irregular cities and the new Hippodamic system caused serious dislocations. *(Plate 26.)*

It has happened quite frequently that instead of revising the old layout, the city was transplanted to a new location, which practice continued from the fifth to the third century B.C. The other method of improving older cities by planned enlargement has been revealed through the excavations of Pompeii. The market center in this case is surrounded by narrow and irregular street arrangements and forms a complete unit together with the forum containing public buildings and the most important temples. In contrast to this is the system of straight and symmetrically built residential quarters. *(Plates 30, 31.)*

There is every reason to believe that Greek architecture and city planning was based not only on intuitive procedures but equally on a formal theory. The Greek archaeologist Doxiadis has furnished evidence for the existence of geometric systems which, although long vanished, have directed Greek architectural thought.[25] Doxiadis presents in *Space-Order in Greek City Building* the results of comparative studies which he conducted on twenty-five major Greek civic centers. This seems to reveal a strict mathematical formality at the bottom of classic practice which includes symmetrical as well as asymmetrical patterns. *(Plate 24, fig. 91.)*

The term *idea* implies according to Plato the meaning of *essential form.* We still have to explain fully the deeper relationship between different

philosophical speculations and their architectural conversion into *essential forms* or *styles.* Doxiadis quotes Aristotle to the effect that it is decisive for the recognition of truth whether space is considered of finite or infinite dimensions. This issue is reflected in the different treatment of Doric and Ionic space formulation. In the first case the conception of the finiteness of space is symbolized by the corresponding sensation of architectural openness, while in the second case the idea of infinity finds adequate expression in complete spatial enclosure.

Schumacher has pointed out that the Doric Weltanschauung of Plato, Aristotle, and the Pythagoreans accounts not only for the ensuing space conception but also in general for the classical ideal of calmness, harmony, and balance. Claustrophobia had no place in such a scheme, and there was no reason for an architectural form intended as a symbolical protection against the uncertainties of infinity. In the wake of changing Ionic ideas about the universal order, from the Ionic conception of finiteness to Ionic infinity, the psychological demand for symbolical protection against the abyss of an infinite universe is met successfully by a corresponding architectural medium.

The problematic, yet characteristically essential controversy of changing space conceptions runs like a thread through architectural history from its early beginnings. It reached a climax during the Gothic with resulting amalgamation of both ideas which has been described as the historic task of the Christian Occident. This rational-spiritual background needs fuller exploration before we can afford to speak about it with any degree of certainty. All we know is the fact that the eclectic imitations of these architectural metaphysics are shallow forms lacking the motivating impulse of speculative philosophy which at first led to the creation of the originals. Modern architecture, as we shall see, is only beginning to regain the spirit of art creation under similar conditions of sensation and thought and may ultimately continue where the principles of traditional formality left off hundreds of years ago. *(Plate 24, figs. 99, 100.)*

Doxiadis succeeds in proving that the civic centers of ancient Greece follow a geometric system which is closely related to the perspective law of the twelve divisioned Doric or the ten divisioned Ionic circular systems which in turn correspond to the 30° or 36° angle of vision. This enables the eye from a certain position to grasp each building separately and completely. Doxiadis cites the Asklepieion in Kos as an Ionic example for his theory. It applies to both the symmetrical and the asymmetrical scheme. The lower terraces (300 to 250 B.C.) are arranged without axis, giving an impression of accidental or informal character. In reality the seemingly scattered layout is governed by the ten divisioned Ionic system with corresponding 36° angle of vision from

the points F and H at the entrance to the terraces. The upper terrace (160 B.C.) is the first example of an axial arrangement. It belongs to the same Ionic order of vision. *(Plate 24, fig. 91.)* The result of this inquiry, apart from other speculations, should make us seriously question all contentions that Greek architectonic planning was a purely intuitive and informal affair based on the freedom of individual "instinct."

By analogy we can derive from this principle the long assumed relationship between architecture and music. Schumacher mentions Vitruvius who treats this subject profusely as "harmonia," although his primary interest is the practical application of acoustical laws to theaters and arenas. He based his theory upon Aristotle's disciple, Aristoxenes, who is considered the scientific founder of a theory of music for his *Elements of Harmony and Elements of Rhythmics.* Therefore, the philosophy of measure and of number must not only be considered the mother of mathematics but of architecture and music as well.

With all due respect to the factors of intuition and imagination which, after all, are equally indispensable for a final success of all the physical and social sciences, it must be reiterated that architecture as an art has distinct intellectual connotations. Leonardo da Vinci pointed this out by saying that art becomes more and more scientific and science more and more artistic the further they advance. Another proof for this axiom comes from the Gothic cathedral which is spoken of as the product of a highly complicated intellectual climate. The Gothic cathedral represents, according to Schumacher and other evidence, cited in Chapter Two, scholasticism, mysticism, and mathematical inclination, the three currents of Medieval mentality.[26] These Greek and Gothic principles of ceremonial formality do not differ fundamentally from those of Oriental and pre-Columbian origins.

A comparison of pre-Columbian architectural conceptions of space and time with those of the Orient yields surprising analogies. The idealistic culture of the Chinese, like that of the pre-Columbian, is reflected in his architecture and his cities. The Great Wall of China, from the third century B.C., which is called one of the most significant structures in the world, resembles in spirit and structure the Great Wall of Peru.

But also pre-Columbian palaces and temples show qualities similar to those revealed in Chinese structures. In both cases an imposing picture of the Universe is expressed under the conception that "the means should not be given greater importance than the end." The metaphysical interpretation of

an existing order, as well as the delineation of the world of phenomena by mathematical means, is symbolized in architectural forms. *(Plates 22, 23.)*

The Temple of Heaven in Peking and the Imperial Palace, two of the world's most extensive structures, are rivaled by the buildings of pre-Columbian civilizations. Another correspondence can be discovered in the selection of locations and sites for cities, temples, and tombs. Mountainous sites, river and valley locations, are chosen not only for suitable defense purposes, water, and wind conditions, but equally for their symbolic references and esthetic qualities. This is coupled with an astonishing ability for harmonizing ethical and esthetic demands with environmental conditions and functional requirements of community life. *(Plate 32, figs. 123, 124, 125.)*

Ancient town building in China arranges the location of gates not following the axis of main thoroughfares but a short distance to the right or left from them. The deviation from strict symmetry in this case is based on superstitious habits whereby "good luck which enters the city should not be able to run straight out at the other end and be lost."

It has been shown by Ananda Coomaraswamy in *The Transformation of Nature in Art*[27] that the European and Asiatic approaches to art meet on "absolutely common ground." He compares the literature of Master Eckhart and Sankara, the brilliant interpreter of the Upanishads, who created the "Vedanta system of pure monism accepted by a majority of all Hindus and analogous to the idealism of Kant." This intellectual approach could be at will extended to the trends of surrealism in modern art. Though rather imperfect in procedure and result, if compared with what is described below, surrealism represents an attempt of "intellectual organization" of artistic form in reaction against the romantic conception of beauty. The new art criticism has not taken much cognizance of the fact that the psychoanalytical approach of surrealism is a functional part of Oriental, pre-Columbian, Gothic, and other phases of history.

Coomaraswamy reminds us of the common practice in the art of Europe and Asia, which fact was forgotten in Europe for a long time. In this the mind was considered "a part, and the most important part of our knowledge of nature." He wants us to realize that: "Life itself—the different ways in which the difficult problems of human association have been solved—represents the ultimate and chief of the arts of Asia; the forms assumed by this life are by no means empirically determined, but designed as far as possible according to a metaphysical tradition conformably with a view to facilitating the attainment by each individual of approximate perfection in his kind. Even town-planning depends in the last analysis upon considerations of this kind.

Neither the society nor the specific arts can be rationally enjoyed without a recognization of the metaphysical principles to which they are thus related, for things can be enjoyed only in proportion to their intelligibility, speaking, that is, humanly and not merely functionally."

Coomaraswamy asserts that "the Indian theory, in origins and formulation . . . does not in fact differ from what is implicit in the Far Eastern view of art, or on the other hand, in any essentials from the Scholastic Christian point of view . . .; it does differ essentially from the modern non-intellectual interpretations of art as sensation." He points to the accepted standards in Oriental art whereby "all works of art have definite and commonly understood meanings, apart from any esthetic perfection of the work itself." He finds this approach also reflected in Master Eckhart's views of art where "the artist is not a special kind of man, but every man is a special kind of artist. Every activity involves what we should now call an esthetic process, a succession of problem, solution, and execution. Materials apart, whoever acts in the same way, will follow the intellect, whether he makes a house, or studies mathematics, or performs an office, or does good works."

He deplores the modern development by which the artist "no longer conceives his art as intellectual, but only as emotional in motivation and significance. . . . All alike have lost, in that art being now a luxury, is no longer the normal type of activity, . . ." In contrast to the way in which "cultured citizens in Paris and Cologne thought of art during the twelfth and thirteenth centuries" our modern historical approach to art "may be harmless in itself, yet no better than the satisfaction of curiosity; the enjoyment of works of art merely as a pleasure of the eye or ear may be harmless in itself yet no more than an enhanced sensation. If this were all, esthetics would be nothing more than a discussion of taste, and so indeed the experimental psychologist believes." The modern informal or unceremonial approach is basically different from the practice of a formal or ceremonial art creation and appreciation of Oriental, Greek, Gothic, or pre-Columbian art where "form is a revelation of essence."

II ARCHITECTURE IS SYMBOLIC

"All the great arts require discussion and high speculation about the truths of nature; hence come loftiness of thought and completeness of execution."—Plato, *Phaedrus*, 270.

I. Pre-Columbian Spiritual Values as Architectural Functionalism

Modern economic-technical experimentation methods have succeeded in changing the face of the earth but so did their "primitive" forerunners, although on a smaller scale. *It is the psychological factor which decides over success and failure in man's cultural efforts,* and this is being investigated now with the same vigor as physical phenomena.

Pre-Columbian architecture in its complexity reveals a chronological order of different basic phases. "Most of the sculptural and architectural art changed from an archaic phase to a naturalistic, from a naturalistic to a formal, from a formal to a flamboyantly archaistic, and then ceased altogether."[28] Functional archaic forms are adequate in their primary purpose for mental self-preservation. Symbolic forms and abstract objectivations emanate from the impulse of creative speculation upon an eternal order. But at times this seems to have been replaced by the decorative use of symbolic elements designed merely for visual pleasure. This must have been prompted by a general change in mentality from reality toward illusion. *(Plate 24, figs. 84, 85, 86, 87, 88.)*

But the important thing is that *pre-Columbian architecture contains as a whole that degree of spiritual stability which prevails through all significant architecture of the Orient and Occident.* This does not exclude, of course, expressions of materialistic tendencies. The discovery of such spiritual aspirations and inspirations asks for their metaphysical interpretation. Yet this can only be done if we are prepared to recognize the existence of *spiritual value* or, as Bergson calls it, the Elan Vital.

W. Y. Evans-Wentz explains that: "The higher or secret teachings, which lie hidden at the root of all the chief world religions, always have been, as they are today, transmitted sometimes wholly telepathic, sometimes entirely by symbols, often only oral, and never completely by means of written records. A similar system of secret transmission prevailed in all the Mysteries of Antiquity, in Egypt, Greece, and Rome, or wherever the Mysteries were established, as it did amongst the Druids of Gaul, Britain, and Ireland. At the present time it prevails in the occult fraternities of India and Tibet, and elsewhere. Remnants of an ancient occultism exist amongst the aboriginal races of both Americas, of Africa, Melanesia, and Polynesia, in the form of religious societies."[29]

Pre-Columbian architecture and art are furthermore of mythological significance and therefore qualify as philosophical procedure to study mental man. Modern science, anteceded by mythology, represents in the last analysis just another form of symbolism. For this reason, the subject matter of symbolism is firmly established as a fundamental part of modern science and philosophy.

The existence of ancient Mexican manuscripts has made it possible to study the prehistoric life in Mexico and Central America. From them we derive appreciable data apart from the monuments and artifacts which have been discovered together with them. The surprising similarity of the early history of writing, according to A. N. Tozzer, over most parts of the world is revealed by the use of mnemonics or reminders from which the picture writing developed. The next step is the ideographic stage in which the idea takes the place of the picture. It is such development from the realistic to symbolic writing by which we can also explain the evolution of ornamental art.

The manuscripts form only a part of the available material for the study of the writing of the people of Mexico and Central America. The extensive use of stone carving on the facades of buildings, on altars and stelae, and on the lintels opens up another extensive source from which examples might be drawn."[30]

II. Esthetics and Symbolism in the Light of Architecture

W. M. Urban refutes the theory of A. N. Whitehead that "symbols throw no light by their own natures on the objects to which they refer." He explains that a "symbol is an expression, and the criterion of its truth, as in the case of all expression, lies in its adequacy. . . . The truth of a symbol, whether in art, religion, or science, is seemingly at least definitely conditioned by the nature of the symbolizers. . . ." In following Urban's argumentation con-

cerning the development of language, we may also say that the development of architecture is "one from copy to analogy and from analogy to symbol." Further reference is made to the symbolizing function as based on "symbolic consciousness." The allegorical symbol as a consciously conceived type is comparatively easy to understand in contrast to the one which has its roots in the unconscious formulation of "original symbolism." Urban relies upon certain principles of symbolism for the process of interpretation.[31]

Plato sees behind all artistic formulation the philosopher's idea, the imitation of an idea's essence but not its image. He attaches the greatest importance to artistic production recognizing its moral values providing it is wisely guided as "symbolic expression of psychic characteristics."[32]

There exists a distinction between the *moral theory* as concerned with ends and values and the *criticism* of those ends and values. Dewey believes that the relationship between existence and value or between the real and the ideal is the most far-reaching question of all criticism. As to ends and values in consciously formulated art, Dewey recognizes its instrumental quality for education.[33]

Jacques Maritain, as the modern interpreter of Thomas of Aquinas, exerts a particularly strong influence upon Latin-American philosophical thought, and he must be considered wherever hemispheric rapprochement is involved. In his *Art and Scholasticism* he says as follows:

"Art is before all intellectual and its activity consists in impressing an idea upon a matter. There is a curious analogy between the Fine Arts and wisdom. Like wisdom, they are ordered to an object transcending man and of value in itself, whose fullness is without limit, for beauty is as infinite as being. . . . Their whole value is spiritual and their manner of being is contemplation. . . . 'The being of all things derives from the Divine Beauty,' says St. Thomas. In that respect, then, the artist imitates God, Who created the world by communicating to it a likeness of His beauty.

> 'The architect, by the disposition he knows,
> Buildeth the structure of stone like a filter in the waters of
> the Radiance of God,
> And giveth the whole building its sheen as to a pearl.'

"On the other hand, to create a work of beauty is to create a work resplendent with the glitter or the brilliance, the mystery of a *form,* in the metaphysical sense of the word, a radiance of intelligibility and truth, an irradiation of the primal effulgence."

Speaking of the Middle Ages, Maritain says: "Matchless epoch, in which an ingenious folk was educated in beauty without even noticing it, as perfect

religious ought to pray without being aware of their prayers; when doctors and painters lovingly taught the poor; and the poor enjoyed their teaching, because they were all of the same royal race, born of water and the Spirit!"[34]

It is interesting, as we shall see, how little difference exists between Jacques Maritain's and Johan Huizinga's historic evaluations of the Medieval Gothic which in their exuberance are quite frequently termed as being idealized if not grossly exaggerated.

The insufficiency of written records makes it difficult for us, if not impossible, to ascertain the esthetic sentiment of pre-Columbian man and his reaction to his contemporary art. Therefore we are obliged to reconstruct the standards of pre-Columbian art appreciation without which our knowledge of this epoch would remain incomplete. It may be quite safely assumed that pre-Columbian man, in a sense similar to Gothic man, admired the content and dignity of the art subject as well as its masterful technical presentation, reacting predominantly with the ethical and *not* purely esthetic emotion.

Jacob Burckhardt (1818–1897) and more recently Johan Huizinga have succeeded admirably in leaving us a complete and significant picture of different historic periods by *envisioning* the cultural and social interactions in both cases, Renaissance and Gothic. Two fundamental phases of Western civilization have thus received an appreciation in accordance with their original magnitude. The vision and interpretation of Burckhardt and Huizinga point the way for our approach to the more remote pre-Columbian theater.

Huizinga[35] warns us: "A scientific historian of the Middle Ages, relying first and foremost on official documents, which rarely refer to the passions, except violence and cupidity, occasionally runs the risk of neglecting the difference of tone between the life of the expiring Middle Ages and that of our own days. Such documents would sometimes make us forget the vehement pathos of Medieval life, of which the chroniclers, however, defective as to material facts, always keep us in mind.

"The modern reader of newspapers can no longer conceive the violence of impression caused by the spoken word," and we may add the symbolic function of art forms "on an ignorant mind lacking mental food. . . . All this general facility of emotions and spiritual upheavals must be borne in mind in order to conceive fully how violent and highstrung was life at that period." Huizinga's interpretation seems to assume particular meaning for our purpose if we consider its apparent analogy to pre-Columbian mentality.

It seems, therefore, only logical that the age "could not dispense with the severest rules and the *strictest formalism.* All emotions required the rigid system of *conventional forms,* for without them passion and ferocity would

have made havoc of life. By this sublimating facility each event became a spectacle for others; mirth and sorrow were artificially and theatrically made up. For want of the faculty to express emotions in a simple and natural way, recourse must needs be had to esthetic representations of sorrow and joy."

In the pre-Columbian as well as in the Middle Ages "the symbolist attitude was much more in evidence than the causal or genetic attitude. . . . From the causal point of view, symbolism appears as a sort of short-circuit of thought. Instead of looking for the relation between two things by following the hidden detours of their causal connections, thought makes a leap and discovers their relation, not in a connection of cause and effect, but in a connection of signification or finality. . . . Having attributed a real existence to an idea, the mind wants to see this idea alive, and can only effect this by personifying it. In this way allegory is born. It is not the same thing as symbolism. Symbolism expresses a mysterious connection between two ideas; allegory gives a visible form to the conception of such a connection. Symbolism is a very profound function of the mind; allegory is a superficial one. It aids symbolic thought to express itself but endangers it at the same time by substituting a figure for a living idea. The force of this symbol is easily lost in the allegory. . . . The ethic and esthetic value of the symbolical interpretation of the world was inestimable. Embracing all nature and all history, symbolism gave a conception of the world, of a still more rigorous unity than that which modern science can offer. Symbolism's image of the world is distinguished by impregnable order, architectonic structure, hierarchic subordination."

Symbolism has lost out in modern art because "symbols and allegories have become a meaningless intellectual pastime, shallow fancifulness resting on single analogy." The pre-Columbian era has witnessed all the different stages of the Gothic in which "symbolism opened up all the wealth of religious conceptions to art, to be expressed in forms full of color and melody, and yet vague and implicit, so that by these the profoundest intuitions might soar toward the ineffable," until "the craze of symbolism spreads to profane or simply moral matters, decadence is manifest."

There is the period where flamboyant architecture is "like the postlude of an organist who cannot conclude. It decomposes all the formal elements endlessly. It interlaces all the details. There is not a line which has not its counter line. The form develops at the expense of the idea, the ornament grows rank, hiding all the lines and all the surfaces. A *horror vacui* reigns, always a symptom of artistic decline."

We can establish another parallel between pre-Columbian and Medieval art. Both knew only applied art, and therefore the distinction between craftsmen and artists did not exist.

"Art," says Huizinga, "was not yet a means as it is now to step out of the routine of every day life to pass some moments in contemplation; it has to be enjoyed as an element of life itself, as the expression of life's significance. . . . Purpose and meaning always preponderated over purely esthetic values. . . . In the great works of art . . . the nature of the subject was far more important than the question of beauty."[36]

Pre-Columbian civilizations expressed their intellectual speculations as esthetic culture through the emotional medium of form selection and organization. Thus it accomplished the rational understanding of its ideals. Dewey says, "A truly artistic work is manifest in the reduction of subject matter to a medium of expression of emotion."[37] While Bergson[38] distinguishes between two kinds of emotion, Dewey sees in emotional response an "ordinary though intimate experience." William James, like Bergson, thinks of consciousness as a totality and the use of the term "psychic overtones" is significant for his inborn transcendentalism.[39]

Even more helpful in a psychological study of pre-Columbian symbolism is C. G. Jung because of his psycho-analytical approach to mythological thought. He has introduced the thesis of "archaic-symbolic" thinking for the interpretation of primitive art. His penetrating analysis of irrational matters in Oriental philosophy should prove equally helpful in setting up a working hypothesis for the exploration of pre-Columbian symbolism.

Jung pays particular attention to the question of meaning behind forms. He believes that the general trend of symbolism, no matter if as language or formalistic expression, is from the physical to the spiritual and that therefore "every symbol stands for some object, and interpretation of the symbol is the determination of that object." Urban agrees with this essential function of the symbol by adding that "an emotional intuition of values is not the essential function of the symbol; it is to give us insight into or knowledge of certain aspects of reality."[40]

Since an elaborate literature of the Upanishads, which is complimentary to the Vedas, was made accessible to Western scholarship, scientific opinion has not hesitated to admit the astounding depth of the Eastern mind. The modern doctrine of Pragmatism condemns the *a priori* form of thought exhibited in Plato's dualism which separates physical and psychical existence and also implied in Aristotle's idea that metaphysics equals eternal reality. The Pragmatists replace this classic conception of the great idealists with "synthetic unity of apperception" based on empirical experience as the foundation of all knowledge.

The Orient's conception of reality embraces both points of view by contending that matter is "crystallized mental energy" and that "duality is present in appearances but not in essence," therefore merely being two aspects of the *One* which is the mind or cosmos. Its Christian counterpart can be found in Jacob Boehme's book on the soul as "mirror of wisdom" or "philosophical eye."

Evans-Wentz argues that: "While the Occidental may not question the validity of this law of cause and effect when applied to physics, he does question it when applied to psychics. In assuming such an attitude, the Occidental, in the eyes of the Oriental, ceases to be scientific, inasmuch as he fails to see that in any complete science of man the physical cannot be separated from the psychic. The present trend of Western science appears to be, however, quite definitely towards this psycho-physical view of the Oriental, which is dependent upon his postulate that nothing has real existence save Mind. . . . For instance, James Jeans in *The Mysterious Universe* makes the following surmise: 'The old dualism of mind and matter . . . seems likely to disappear, not through matter becoming in any way more shadowy or insubstantial than heretofore, or through mind becoming resolved into a function of the working of mind, but through substantial matter resolving itself into a creation and manifestation of mind."

The pragmatic assertion that reality evolves through constant change is recognized by the Buddhistic doctrine of the "impermanence of things. One phenomenon instantaneously arises and gives place to another, as one thought gives birth to another."[41]

Jung summarizes the controversy thus: "No chain of reasoning can prove or disprove the existence of either mind or matter. Both these concepts, as every intelligent man today may ascertain for himself, are mere symbols that stand for something unknown and unexplored, and this something is postulated or denied according to man's mood and disposition or as the spirit of the age dictates. There is nothing to prevent the speculative intellect from treating the psyche, on the one hand, as a complicated biochemical phenomenon, and at the bottom a mere play of electrons, or, on the other, from regarding the unpredictable behavior of electrons as the sign of mental life even in them.

"The fact that a metaphysics of the mind was supplanted in the nineteenth century by a metaphysics of matter, is a mere trick if we consider it as a question for the intellect; yet regarded from the standpoint of psychology, it is an unexampled revolution in man's outlook upon the world."[42]

III. The One World Prospect

Contrary to the popular belief that Buddhism is pessimistic and nihilistic, the altruism of Eastern philosophy sees man as unlimited master of his fate. Such optimism, which is paralleled by Christianity, could not fail to impress Western civilization. This has found eloquent expression in the literature of Walt Whitman, Emerson, Thoreau, Bernard Shaw, and others. Walt Whitman called for the use of America's great spiritual potentialities thereby initiating the new artistic consciousness which found enthusiastic response in Latin America. At the same time he opened his mind to the inspirations of the East, recognizing the shortcomings of our own civilization in all its diversities.

The role of Walt Whitman in linking, not only the cultural potentialities of all Americas, but in an enlarged sense the dormant Western heritage to a living Oriental civilization has deeper implications for the approaching phase of intellectual world integration. This has been recognized by Rabindranath Tagore. The great Hindu Nobel prize winner and champion of East-West assimilation saw in Walt Whitman the greatest American poet. Tagore wanted to restore the human touch to Occidental industrial civilization by interpreting India's philosophy and poetry to the West. To do this and also to teach to the East the values of Western modern realism he created his famous academy of Santiniketan, which is now part of the International University Vivsoa-Bharati. Oriental spiritual idealism combined with Occidental mechanistic realism was in his opinion destined to become instrumental for the achievement of lasting peace.

It is interesting to note that Tagore's pupil, the Hindu poet, Krishnalal Sharidharani,[43] draws attention to a similarity which exists between the inspiration behind the idea of Tagore's forest school and Henry Thoreau's "Walden." In both cases "meditation is natural." This cosmopolitan approach expresses itself as a growing tendency of assimilation between scientific progress and spiritual tradition. It may be taken as a step in the direction of a permanent balance not only of Inter-American but at the same time of East-West relations in a new civilization, the "One World" of tomorrow.

III DISTINCTNESS VS. VAGUENESS, THE ECOLOGICAL PROBLEM OF THE MODERN CITY

"The method which proceeds without analysis is like the groping of a blind man. Yet, surely, he who is an artist ought not to admit of a comparison with the blind, or deaf."—Plato, *Phaedrus*, 270.

It may seem as if the foregoing matter of Occidental-Oriental thought-relationship does not quite belong in a discussion on architecture. But after careful consideration of all the pros and cons which make up the controversy among the avant-guarde of contemporary architecture, we must come to the conclusion that the *interpretation of mind-body relations has still survived as its most vital issue.* Although this problem is an old question in philosophy and art, it has never before in history carried so little weight as a cultural factor. It is therefore our foremost duty to see to it that *intellectual* clarification is achieved so that artistic consciousness may function again organically. In such an endeavor, the role of "Oriental enlightenment" seems indispensable. So far, modern architecture has followed the example of modern painting and sculpture by splitting into as many schools of thought as psychology itself.

As I have emphasized on other occasions, we are much too one-sided in our concern for the organization angle in attempting to solve the problems of architecture and city planning. We take it for granted that the subject matter to be organized is already in the bag, while we are only beginning to formulate the problems awaiting solution by the scientific means of research and experimentation.

Positive principles for the physical planning of urban and rural environment are lacking. This is revealed in a proverbial vagueness of the modern community physique, which contrasts strangely with architectonic definiteness displayed all through history.

It is therefore the interpretation of history that will influence decisively our attitude and efforts toward a more conducive basis for future action. The merging of philosophical, scientific, and technical thought is required *before* research and experimentation can start to supply production lines with a valid scheme for housing, road and highway systems, for recreation, hygiene, and work facilities—in short, for the community in town and country.[44]

I have tried to show that the biological function of architecture demands the establishment of a *scientific therapy of housing.* This could evolve from the combined potentialities of psychology and modern technology. Industry is already preparing to give us the "engineered house," contending that revolutionary changes are only necessary in so far as construction methods are involved while design would take care of itself if left alone.[45] This statement reveals the problem in a nutshell. It implies that design is considered merely decorative and therefore superficial. This conception of design must be rejected not only because it has been practiced too long to be ignored but also because the marvelous achievements of technology should make it possible to realize the psychological and physiological demands of architecture in the form of esthetics, therapy, and mental hygiene.

Mental hygiene as applied to architecture means among other things the *revival of the monumental approach,* discarding, of course, any repetition of shallowness and aggrandizement. With housing a mass fabricated commodity and almost everything else from transportation to public health a utility, the spiritual quality of physical environment is almost entirely restricted to the monumental elements of architecture in community and city planning. The result of my previous investigation in which I compared the principles of Gothic architecture with the requirements of modern mental hygiene has convinced me that the same relationship can also be established for certain phases at least of pre-Columbian architecture.

Among the critics on the problems of city planning procedure is Eliel Saarinen, who proposes in his *The City, Its Growth, Its Decay, Its Future* that we should not try to find "something of our own." His approach emphasizes that new methods should take into consideration organic growth as displayed in nature and in the Classic or Gothic order. He holds that present day problems are the outgrowth of our disregard for this basic principle.[46] Frank Lloyd Wright disagrees decidedly with any effort to introduce "Medieval or European forms" which are "all beside the modern mark—stumbling blocks really—all."[47]

It is quite true that we can establish analogies, at least to a certain degree, by comparing an organic order in physical planning with that of nature's in cell tissues, their microscopic structure, growth, and decay symptoms. But

we must keep in mind that structure and behavior symptoms of the individual and society differ considerably from purely biological processes. This is borne out by scientific studies in ecology which reveal the existence of regional ecological patterns in plant, animal, and human life. But at the same time it has also been demonstrated that human behavior is quite independent of those biological laws.

The community form in city, town, and village has been subjected to extensive ecological research from which we may derive a certain working order. We learn of the various pathological processes of disorganization resulting, for example, from extremes in concentration or distance. We also learn about the psychological and ecological factors responsible for form and layout of individual habitation and cities. Social interaction and organization determine the pattern and the metabolism of urban and rural communities. Lewis Mumford[48] has given much thought to the acceleration of tempo and metabolism through the machine and has dealt with obvious repercussions upon the social and physical mobility of communities. This leads to the individual human being as the final recipient of changes in any psychological organization.

C. M. Child[49] compares the differentiation and integration of regional areas with the controlling scheme of the cerebral cortex in higher organisms. The question remains as to how far the success of former civilizations in architectonic city planning can be traced to their unconscious compliance with those rules. There seems to be no doubt that the pre-Columbian, Gothic, Chinese, and Greek community was not conceived as a purely economic or technological problem, as we are inclined to think of urban and rural planning for the future. *Former civilizations show paramount efforts to take care of mental evolution by providing the formality of ceremonial "styles" for dramatization and social sublimation.*

Pre-Columbian cities are planned in accordance with religious principles by using symbolic layouts and arrangements of temples, streets, and open spaces, interrelating these with environmental factors. In contrast to this, modern cities are characterized by lack of "cultural integrity." *(Plates 22, 23.)*

"All cities exhibit extreme mobility, on the one hand, possessing the twofold aspect of spatial movement and mental plasticity, and social distance, on the other, which is eternally challenged by man's change in physical and social position and his individual variation and versatility. Cities are thus the battle ground of the titanic conflict between acquisitions of specialization achieved by individuals, groups, and institutions, spatially separated and socially oriented, and the new gifts, ideas, experiences, and values which

individual mobility and variation assure for society. In this conflict, which is the keynote of the urban social process, man undergoes a profound psychological change."[50] *(Plates 34, 35, 36, 37, 38.)*

The psychologist is confronted with the many implications of a rapidly growing new environment. This has already entered the conflict stage in man's traditional behavior pattern. One of the most decisive dislocations has been produced by specialization. This new phase of evolution has greatly weakened the former homogeneity of individual and society. But, at the same time, it has widened the scope of human variation.

The constant acceleration of modern civilization is a totally new phenomenon in the history of man. Naturally the conditioning process to this changing external environment is one of our greatest problems. Since man's reactions to his external environment are bound mainly to his visual perception, the conditioning role of planned physical environment is obvious. It therefore becomes the medium through which we can successfully influence processes of cultural interaction.

But this involves complicated processes which ecology is now trying to work into a system. The factor of mitigation, for example, is responsible for modern man's lessened reaction to his external environment. He has become comparatively safe from nature and therefore more or less independent of it. This was achieved by the introduction of mechanical safety valves. But at the same time the machine age must be held responsible for a great loss of inherent sensory alertness and receptiveness. The pre-Columbian, Greek, and Gothic periods afford excellent examples to prove the former extent of such human qualities.

This *softening process* of modern man's sensory apparatus must be fully understood in its many implications before discussing the cultural and social role of architecture, city planning, and art in general. It is the steadily accelerating change in the mental and physical setup of modern man which demands our attention for the psychological requirements in all future planning efforts. The mere utilization of such physiological processes, as blood circulation, are only of secondary importance though they might suggest analogies insofar as the *mechanical demands* of city planning such as traffic circulation and street systems are concerned. The organismic analogy is of little help, if not actually misleading when dealing with the primary symbolic function of architecture.

It is equally important to understand the relationship between memory and intelligence. This should prove to be of great assistance in making the

right use of *monumentality* and symbolism opening up at once new perspectives in our slow moving recognition of a psychologically indispensable *formality for a new and symbolic architecture.* This may be explained by the functions of human cognition. The degree with which our memory is capable of recording and remembering a stimulus intelligently depends on the qualitative intensity of our perception processes. This in turn is governed by the quantitative limitation of our brain to store impressions. In other words, the selection of fewer but qualitatively stronger impacts upon our memory will produce intensification of our reactions upon which our behavior depends to a large degree. From this we may derive among other things the value, and even a necessity, for readapting the *monumental approach* in architectonic planning as exhibited in pre-Columbian, Gothic, and Greek architecture. During these periods man has understood to an admirable degree how to utilize available knowledge of the hidden sources of human actions.

The principle of biological flexibility insures man's great adaptibility to an ever-changing environment. But we must realize that all our attempts to translate this principle efficiently into physical environment must remain of an approximate nature. From this seems to follow that any set of architectonic principles should include the factor of flexibility which is entirely independent from such connotations as symmetrical, asymmetrical, regular, irregular or organic and geometrical. We cannot very well assume, for example, that the gridiron pattern per se does not represent a definition of order. Success of *any* scheme is determined by the intelligibility of its directing mental operations, no matter if they are of a symbolistic or causal nature, and of course, by the skill with which the necessary coördination and integration of all material factors is conducted. Failure may be due to a detrimental application of otherwise sound principles, if not to a complete lack of them, in which case we would be justified to speak of an unintelligible procedure.

We have good reason to believe that the ceremonial qualities of symbolistic formality in Gothic or Greek architecture and city planning can function as object lessons in our present architectural considerations. But the study of other examples from the Orient and the pre-Columbian era should assume similar significance, especially in the light of regional characteristics. Each one of these different esthetic manifestations reveals a basic uniformity of social and cultural interactions.

IV SIGNIFICANT ARCHITECTURE AS CULTURAL CONSCIOUSNESS

"Let our artists rather be those who are gifted to discern the true nature of the beautiful and graceful; then will our youth dwell in a land of health, amid fair sights and sounds, and receive the good in everything; and beauty, the effluence of fair works, shall flow into the eye and ear, like a health-giving breeze from a purer region, and insensibly draw the soul from earliest years into likeness and sympathy with beauty of reason."—Plato, *Republic* III, 401.

I. Frank Lloyd Wright

It is not the seriousness and correctness of approach which distinguishes Frank Lloyd Wright's work from that of Le Corbusier and other outstanding contemporary architects. It is rather his unique success in converting cultural consciousness into architecture.

I need not elaborate on the deep influence which Walt Whitman exerted upon Frank Lloyd Wright. But it may be of value to point out again that Walt Whitman's preoccupation with the American farmers' and workmen's moral and spiritual growth was reflected in his specific plea for the amelioration and reform of existing housing conditions. Several articles in *Life Illustrated,* from 1856, entitled "New York Dissected" and "Decent Homes for Working Men," deal with the subject extensively. The idea of the fraternal spirit is closely linked to his humanitarian poetry, giving constructive expression to his criticism of the social ills of his day. He writes about housing conditions: "Not wicked in carelessness of material . . . but in the unrighteous spirit of ostentation that unconsciously directs it, and in the manifold and frightful social evils flowing from it."

In addition to his affiliation with Walt Whitman's philosophical thought, Frank Lloyd Wright has made intimate contacts with the Orient and has

received a strong impetus from the pre-Columbian culture. His artistic-philosophic achievement may be described, therefore, as the *quintessence of the modern problem complex.* This has found ready response from Europe which is summarized in Bruno Taut's *Modern Architecture:* "The next heroic figure, after Sullivan, is Frank Lloyd Wright. . . . He is an architect miles ahead of the artistic conceptions of Europe of about 1900. . . . His horizontal and projecting planes are wonderfully expressive of a new age with its newness of thought and expression—evolved by him at the turn of the century, to become the fashionable craze in Germany, thirty years later!"[51]

J. P. Oud says in *Hollandische Architektur* that any art criticism, if it applies to contemporaries, is necessarily inadequate. But he feels justified in describing the towering figure of Frank Lloyd Wright as one of the greatest of our time, without fear that a future generation will have to revise this judgment.[52]

H. P. Berlage, the eminent Dutch architect and city planner whose Amsterdam Stock Exchange served to "purify architecture all over Europe,"[53] has probably done most to promote Frank Lloyd Wright's ideas in Europe. The two names of Oud and Berlage represent the new movement in Dutch architecture which must be recognized as the link between Europe and America in their common struggle for the recovery of an adequate architectural expression. This is further illustrated by the existence of two separate currents in Dutch architecture, the Amsterdam and the Rotterdam schools, headed by the two men respectively. In the words of Oud, Berlage's school takes the architecture of the "great American Wright" as an example "more by admiring his work than by understanding his principles." Oud argues that one cannot possibly over-emphasize the difference between creatively continuing Wright's work or being what people like to call "inspired" by his architecture.

Oud contends that the basis of a new and organic architecture can never be derived from an external form but must be developed from an inner necessity. He has endeavored in his own architectural production to exemplify this deeper influence of Frank Lloyd Wright.

It seems that so far the only synthesis of modern architecture is contained in Frank Lloyd Wright's life work. He wrote in the already quoted letter about Broadacre City: "We are still at work upon it as the logical form for Democracy—decentralization *and* in the best Gothic spirit—though not at all in that old form." *(Plate 38.)*

Even so we cannot yet speak of a new formula comparable to Greek, Gothic, Mayan, or Incan architecture. Nevertheless, we have received a *demonstration of significant forms and values* from Frank Lloyd Wright, which may best be

described as a movement back to the original unity, the Latins' *"multum non multa."* Allowing for marginal errors but discounting mere esthetic exercises we are today at least in a position to gauge the general approach toward a new architecture. *(Plates 39, 40.)*

Dewey contends that: "An artist may work with the minimum of analytic recognition of structures and forms; he may select them chiefly by a kind of sympathetic vibration. But they may also be discriminatively ascertained and an artist may utilize his deliberate awareness of them to create works of art that are more formal and abstract than those to which the public is accustomed. Tendency to composition in terms of the formal characters marks much contemporary art in poetry, painting, music, sculpture, and architecture. At their worst these products are scientific rather than artistic. At their best they assist in ushering in new modes of art."[54]

It should be clear, in a psychological sense, that our contention in regard to Frank Lloyd Wright's architecture represents only a first step towards what the Gestalt theory[55] describes as the result of a particular intellectual climate. It is an analogy which refers to the process of plant growth as related to physical climate. Sullivan in his *Kindergarten Chats* calls this external aspect of architecture physiognomy which reveals the character of a building.[56]

The process which seems to be in operation toward a new architecture is not so different from similar currents in modern art and science, utilizing the diversity of global contributions. Frank Lloyd Wright is the outstanding representative of modern architecture in whom such an approach has already found creative realization. The symptoms are indeed the same as have been shown to exist in Walt Whitman's literature or in Rivera's and Orosco's mural paintings, although they are all achieved by different means. *(Plates 39, 40.)*

II. Le Corbusier

But we must also recognize the brilliant contributions of Le Corbusier in the field of architecture and city planning. Similar to Picasso, his influence should be classified as hypothetical and analytical rather than synthetic. As such his work seems indispensable to an intensified quality of modern architecture. *(Plates 34f, g, h, i, 35a, b, c, f.)*

Le Corbusier's influence upon Latin-American countries is of particular interest. In 1936 he submitted his plans for the University City of Brazil in Rio de Janeiro. He was also called to Rio by the Minister of National Education and Public Health on recommendation of the Architects' Executive Committee to assist in planning the new Building of Education and Health.

In 1938 he worked on a regulative plan for Buenos Aires and in 1939 he was asked by the Chilean government to act as consultant for the reconstruction of devastated areas. *(Plates 35d, e, 36.)*

Le Corbusier's reputation as functionalist, rationalist, and utilitarian is contradicted by himself. He writes: "Les oeuvres de l'utilité sont dépassées chaque jour; leur utilité meurt; une nouvelle utilité les remplace. . . . Et l'on ne parle plus d'utilité mais d'amour; la fonction n'est pas considereé, mais l'attitude. Un etre mental est dressé devant nous, une parole d'homme est prononcée. Beauté, ethique, harmonie. Notre émotion est entrée dans le jeu. C'est de poésie qu'il est question. Et ce qui démeure des entreprises humaines n'est pas ce qui sert, mais se qui émeut. L'architecture est le jeu savant, correct et magnifique des formes sous la lumière."[57]

Le Corbusier, the rationalist and poet, is indeed in favor of utility provided it is not localized or fragmentary but filled with a reality revolving around the great human problems. He rejects a purely materialistic approach to architecture and city planning by asking: "Are we to create a new Middle Ages?" And his answer is, "Yes," in so far as *"cette acception comporte de constructif, de créatif, de constitutif."*[58]

France's philosophical and artistic influence upon Latin-American culture is once more exhibited by the great lyric enterprises of city planning in Rio de Janeiro, Sao Paulo, Buenos Aires, and Montevideo. Le Corbusier's constructive ideas have received creative response in the organized shape of those projects giving promise to his hope of a new poetic order in architecture.

V CONCLUSION

"For the life of man in every part has need of harmony and rhythm."—Plato, *Protagoras*, 326.

Architectural modernism, at its best, has a two-fold meaning; it is in many respects a new name for old ways of thinking, but at the same time it represents new forms of thought which may yield startling conclusions. It seems necessary to consider Arthur Sewell's statement in *The Physiology of Beauty:* "In a new art or in a new artistic technique, the novelty of presentation must always wear off before we can make any judgment about the art as 'communication.' The wordy battles that are waged over artistic 'innovations' rarely have any relation to the utility of these innovations in directing and establishing a chain of responses; they are battles between two classes of people and the behaviour that classifies them is not found in esthetic situations alone but in every part of their activities."[59] *(Plates 33, 34, 35, 36, 37, 38, 39, 40.)*

Granting that "modern" and "new" are only the results of cause and effect without beginning or end, we can realize why even timely remote art expressions are still capable of stirring enthusiasm and communicating spiritual value. Architecture, despite its frequent relapse into conventional repetitions and despite its utilitarian responsibilities, has proved the immaterialistic intention of art. But Frank Lloyd Wright points out that "architecture has become too difficult and building too easy," which accounts for the fact that "new facilities are here for which architecture has no corresponding forms."[60]

A necessary change in our attitude of *laissez faire* is strongly advocated by Giedion who says: "Periods incapable of arriving at a consistent outlook on the world are also incapable of carrying out the kind of town planning that goes beyond mere patchwork. And armies of specialists are no help when what is missing is a universal attitude covering the whole of life."[61]

The foregoing chapters are intended to give a hand in such an endeavor. Necessarily this effort has to remain rather fragmentary at this time. It is

nothing more than an attempt to collect materials for comparative consideration and analytic discussion toward a new attitude in architectural thought. Provoked by the profundity of the historic trend, I have stressed the necessity for re-introducing metaphysical propositions. This is nothing new in itself since this demand has been made for science in general[62] as I pointed out in my previous publication.

It seems of equal importance for the attainment of this larger goal to study the principles of symbolism, the theories of architectural tradition, and the new scientific investigation. Modern science has produced evidence of the changing conditions in environmental factors emanating from our highly organized society. The question still stands if we want to follow the general trend of uniformity which asks for rapidly changing standards for the sake of emotional diversion. My previously mentioned proposal for a housing therapy is based on available results of psychological, physiological, and sociological experimentation with form and color. Such a scheme, after careful study, could easily be realized by utilizing pre-fabricated and interchangeable plastic units.

But taking the larger issue, all evidence leads us to assume an ultimate inseparability of past and present philosophical speculation. Any attempt to divorce our own work from the Great Tradition of architecture and philosophy must necessarily result in unintelligibility.

A New Formality of architecture, not in a perfunctory sense, but as a symbolic and ceremonial functionalism could fuse again the organic and the geometric approach. Such a procedure, in order to be perfected, would absorb all the enthusiasm, intelligence, and energy of a revitalized profession.

Sorokin has offered proof, as we have seen before, for the possibility of obtaining creative evaluation from sociology, history, and art criticism based on scientific investigation. Huizinga has made it clear that "symbolism is a very profound function of the mind," and, recalling his above mentioned idea, we realize that this symbolist attitude differs from the causal or genetic attitude of science only in degree, in what he calls a "sort of short circuit of thought." The *philosophical issue,* therefore, seems to present the fundamental problem which modern architecture and architectonic city planning will have to deal with successfully if technology and science are to consider them as not merely incidental. It must be left for future extensive studies to establish more and more relationships toward a hypothetical unity without forcing the issue. (See *"Proposal for a Long-Range Research Program,"* p. 53.) Fortunately the discussion on the subject has already progressed far enough to give hope for an early large scale effort in this direction.

Of course there was no lack of constant effort during the recent past. Individuals and groups "From William Morris to Gropius"[63] have prepared the ground by achieving isolated values against the preponderance of the *Beaux Arts* system. Adolf Loos in one of his early statements expressed the controversy most pointedly by saying that: "Our modern architecture is invented on the drawing board and the drawings are presented plastically as one poses pictures in the Panopticon. . . . Good architecture can be described; it need not necessarily be designed. The Pantheon can be explained; *Beaux Arts* buildings cannot."[64] He verifies this by citing the old masters who used design only as an auxiliary means to communicate with each other and with the executing craftsmen. Walter Gropius and the *Bauhaus*[65] have successfully demonstrated the truth of this axiom under conditions of modern specialization and mechanization.

What is demonstrated in Frank Lloyd Wright's work should be utilized for our future educational procedure. We should give primary consideration to individual experience with original architecture and art objects of the past and present in which the functionalism of cultural consciousness is paramount.

We must, therefore, attach great importance to the study of *pre-Columbian architecture and symbolism,* which represents one of the best integrated systems of artistic realism or cultural consciousness although it belongs to a scope of imagination different from ours. But pre-Columbian like Gothic man or the Chinese had at his disposal the *moral encouragement of his entire culture.* By deciphering the pre-Columbian conception of truth, with the help of modern psychology, we may at the same time contribute by analogy to the process of reintegrating the scattered pieces of partial knowledge in our modern scientific system. In such a study we would discover the performing artist's *special regard for a critical posterity,* from which attitude we could profit materially and spiritually.

It is interesting to recall in this connection that the League of Nation's International Institute on Intellectual Coöperation discussed at one of its last meetings the problems of modern art and reality, "Les Arts et La Réalité Contemporaine."[66] The different representatives included those of Argentine, Bolivia, Brazil, Cuba, Ecuador, Mexico, and the United States.

The delegate from Mexico, Señor Nájera Castillo, summarized the discussion by proposing "to create chairs of contemporary art instruction comprising comparative studies between modern and ancient art." The studies should be at the same time theoretical and practical by blending instruction of contemporary art with comparative history of ancient art. It is assumed that this proposition could be applied in a general way to all countries using the same methods as for the instruction of physics and chemistry.

The representative from Argentine, Señor Arturio Lagorio, expressed confidence on the part of all Latin-American countries in the future instrumentality of art by recognizing the study of pre-Columbian civilization as a *spiritual entity.*

The study of archaeology and history of architecture, as an important phase in the process of *exposure to past intellectual climates,* should include the experience of the physical climate in the sense of Gestalt Theory[67] to which the former belongs. This would constitute in my opinion the best guarantee to avoid the psychological misunderstanding from which eclecticism grows. It would forestall the staging of "primitivism" as well as of Oriental or pre-Columbian imitation which must necessarily result in dead patterns.

It is of little importance for our purpose to determine origins or causes for the puzzling resemblances of symbolic expression between the pre-Columbian era of America and other continents. This may have come about by culture circles or parallelism or culture transmission. Among the numerous theories of Anthropology is one of earlier origin which propounds the "idea of the psychic unity of mankind."[68] In any event it is a fact that pre-Columbian mythology is linked with other geographical districts of the world, that the calendar, signs of the Zodiac, games, and even physical characteristics of the people show a connection between America and eastern Asia. We cannot help but assume that the spontaneous recurrence of symbolic figures in many parts of the world could well prove the existence of a *psychic unity,* because in both cases of idea diffusion and parallel action people have to be similarly conditioned in order to respond psychologically in the same way. From this we must necessarily conclude the otherwise long established fact that present day problems in architecture, like in medicine or technology are basically of the same order wherever they may be encountered in Occident or Orient.

APPENDIX: PROPOSAL FOR RESEARCH PROGRAM

Evolutionary changes in man's mental and physical existence demand the logical application of modern scientific conceptions to the physical planning of rural and urban communities.

Modern medical treatment and nutrition among other subjects represent the result of coöordinated scientific research and its translation into action. It seems therefore not only logical but even mandatory to examine those interactions of human life which pertain to the physical setup of our rural and urban communities.

So far, little attention has been paid to subjects like physiology, psychology, biology, human and social geography, ecology and regionalism which have to make decisive contributions to the scheme of environmental planning such as housing and city planning. Environmental physiology, psycho-physiology (the study of emotional values and reactions inherent in form and color) and other relevant actors must be considered and translated in order to arrive at those planning functions which are the prerequisite for satisfactory modern environment.

This must be viewed under assembly mass production for building by utilizing plastics and other new techniques which are already greatly perfected, waiting for complex application. These new structural procedures and processes promise abundance of form variety for the satisfaction of individual differences and requirements. This is contrary to the popular belief that prefabrication methods must necessarily be identical with extreme monotony.

Eventually, such an approach will enter into the aspects of therapeutic treatment. Modern therapeutics aim at the restoration of organic efficiency by more or less indirect means so that the weakened body may be assisted towards recovery through coöperation of the still efficient organs. This holds true particularly for the ever increasing deficiency diseases, those minor forms of ill health growing out of modern artificial life conditions.

Above all, this should prove of importance in meeting therapeutic needs arising from the present war with between 40 and 50 per cent wounded falling

in this category, according to Dr. Allan Gregg from the Rockefeller Foundation.[3] The Arts in Therapy exhibition at the Museum of Modern Art in New York has already pointed the way for "the use of the various arts and crafts in therapeutic work among disabled and convalescent members of the armed forces."

The sensation of space or the perception of a spatial order such as presented, for example, in built environment or architecture should be looked upon and treated as a natural phenomenon and not only as the result of intuition. This process would then be open to scientific approach as psychotherapy in the form of therapy and mental hygiene by way of a favorable environmental design for dwellings, neighborhoods, working places, public services, and complete communities. This would relieve emotional tension and repression, the by-product of modern mechanized life, immensely aggravated by the war situation.

Mental hygiene must recognize the importance of form and color therapy which combined with aesthetics is an indispensable tool in the struggle for mental health. These aspects of mental hygiene lead to entirely new problems in formulating the modern community physique. They stand out distinctly as a separate issue against the preponderance of all technical phases in housing and communal city planning such as safety in traffic, public utilities, hygiene, building techniques, physical amenities, and comforts,—all of which technology is providing at a rapidly increasing rate.

It is felt that this urgent and basic problem should be attacked at once by coördinating the results of modern engineering with those efforts of medical science which are best identified by the aims of the Public Health Research Institute of the City of New York and similar preventive efforts at Oxford University to get "at the communal roots of illness" by investigating the influence of environmental, domestic, social and genetic factors and the incidents of disease and disability. All indications show that the outcome of such research will necessitate the revaluation of presently accepted "basic standards" of many elements composing the activities or building the rural and urban communities.

[3]The Journal of the American Medical Association, March 30, 1940.

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92. General map of Babylon after Koldewey and others.

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[2]Fritz Schumacher, *Der Geist der Baukunst,* Stuttgart, 1938.
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[6]Haverfield, *ibid.*

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Priene, opposite Milet, about half the size of Pompeii (see Plate 30), *was laid out with Agora, Theatre, Stoa, Gymnasium, Temples,* and *other public buildings in addition to approximately four hundred private houses and contained a population of about 4,000. The dimensions are calculated as having covered an area of about 750 yards in length and 500 yards in width.*

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138. Paris, 1854–1889, the famous Haussman "Operation." From: *Town Planning Review,* Vol. XII.

139. Paris, plan of 1937, by Le Corbusier. (See Plate 35, figs. 141–146.) From: *Le Corbusier & P. Jeanneret, 1934–1938, Zurich,* 1939.

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147. Buenos Aires, directive plan of 1938 by Le Corbusier in collaboration with Ferrari and Kurchan, architects of B.A.; proposal for vitalizing the traditional Spanish-Colonial city layout which was based upon the "cuadra." From: *Le Corbusier and P. Jeanneret, op. cit.*

148. Project "E," 1939, by Le Corbusier. Business and office building for 10,000 employees on the coast of Algiers. Architectural treatment of elevation derived from the functions of the "brise-soleil." From: *Le Lyrisme Des Temps Nouveaux et L'Urbanisme,* by Le Corbusier, Colmar, 1939.

PLATE 36

Rio de Janeiro, Ministry of Education and Health:

149. First proposal; using movable outside sun shades. From: *Le Corbusier and P. Jeanneret, op. cit.*

150–151. Sketch of final proposal adopted to a new site. From: *Le Corbusier and P. Jeanneret, op. cit.*

152–153. The completed project, by Lucio Costa, Oscar Niemeyer, Afonso Reidy, Carlos Leao, George Moreira, and Ernani Vasconcelos, architects; Le Corbusier, consultant. Ph: G. E. Kidder Smith, Museum, Modern Art of New York.

PLATE 37

154. Montpazier (Dordogne). Twelfth century plan. From: Didron: "Annales archéologiques," XII, Paris, 1852.

155. American Colonial town planning. From: *Town Planning Review,* Vol. XIII, No. 1.

156. A glimpse of Rockefeller's Radio City, New York. Ph: Hugo Leipziger.

Greenbelt—town, Maryland. Lewis Mumford says in his introduction to "Greenbelt," by O. Kline Fulmer, that "Greenbelt is a new type of city. It differs radically from both the metropolitan and suburban patterns. . . . There are three outstanding marks of the new community. First, there is a balance between the rural and urban elements: farms, recreation area, woodland reservations are treated as an integral part of the plan. Second, the community is limited in size, density, and extent: a horizontal wall of green, so to say, shuts it off from an inorganic scheme of aimless speculative growth. And finally, modern means of transportation and communication are utilized to make an open pattern, without losing the element of communal unity and coöperation through mere sprawl."

157. Greenbelt, Maryland. The well integrated system of green-areas. Ph: Hugo Leipziger.

158. Greenbelt, Maryland. Town plan.

159. Canberra, the federal capital city of Australia, laid out according to the plan of W. B. Griffin. System of decentralized zones and centers, determined by a particular topography and assigned to the special functions of government, municipality, commerce, industry, residential, suburban and semi-agricultural areas.

PLATE 38

Frank Lloyd Wright in his fight for greater cultural quality in architecture and community planning is "one of the most vocal among the theorists,"[7] dealing effectively with decentralization, the "distribution phase" of our modern era, and industrialization in general. His answer for any transformation of the present city is "Broadacre City." His proposal is based "on the ideas and experiments of Ralph Borsodi, writer and former economic consultant."[8] Frank Lloyd Wright is in complete agreement with Walt Whitman, who once wrote in "Life

[7]Sigfried Giedion, *Space Time and Architecture,* Cambridge, Mass., 1941.
[8]*Ibid.*

Illustrated," under the titles, "New York Dissected," and "Decent Homes for Working Men," on the "Typical American": "It is in some sense true that a man is not a whole and complete man unless he owns a house and the ground it stands on. Each man was intended to possess his piece of this earth; and however the modifications of civilized life have covered this truth or changed the present face of it, it is still indicated by the universal instinctive desire for landed property, and by the fullest sense of independent manhood which comes from the possession of it." Broadacre City presents a plan by which "real property ownership of ground" can be obtained.

160. Model of Broadacre City, by Frank Lloyd Wright. Ph: Museum of Modern Art of New York.

160. Broadacre City, by Frank Lloyd Wright. Model of traffic and highway intersection. Ph: Museum of Modern Art of New York.

162. Model: House on the Mesa (Project: 1931). Ph: Museum of Modern Art of New York.

163. Broadacre City. St. Mark's Tower. Ph: Museum of Modern Art of New York.

PLATE 39

164. Edgar J. Kaufman House, Bear Run, Pa., by Frank Lloyd Wright. View from below waterfall. By special permission from *In the Nature of Materials, the Buildings of Frank Lloyd Wright, 1887–1941,* by Henry-Russell Hitchcock; Duell, Sloan and Pearce, New York, 1942.

165–166. Model of Project Ralph Jesten (Martin J. Pence) House, Palos Verdes, California, by Frank Lloyd Wright. The circular patterns of rooms develop from the use of plywood which is strongest when curved. By special permission from *In the Nature of Materials, The Buildings of Frank Lloyd Wright, 1887–1941,* by Henry-Russell Hitchcock; Duell, Sloan, and Pearce, New York, 1942.

PLATE 40

Florida Southern College, Lakeland, Fla., Project 1938; Construction 1940, by Frank Lloyd Wright. Asymmetrical layout with diagonally running covered walks, built around two centers: the Chapel and the Library. Pool, lake, great fountain, terraces, parking area, and buildings of this project is Frank Lloyd Wright's most comprehensive plan under actual construction. Photos: By special permission from *In the Nature of Materials, The Buildings of Frank Lloyd Wright, 1887–1941,* by Henry-Russell Hitchcock; Duell, Sloan, and Pearce, New York, 1942.

167. Perspective Drawing of general layout.

168. General layout plan.

169. Ann Pfeiffer Chapel, Southern College, Lakeland, Florida, 1940.

ILLUSTRATIONS

See also Descriptive List of Illustrations, pp. 57–68,
for fuller details.

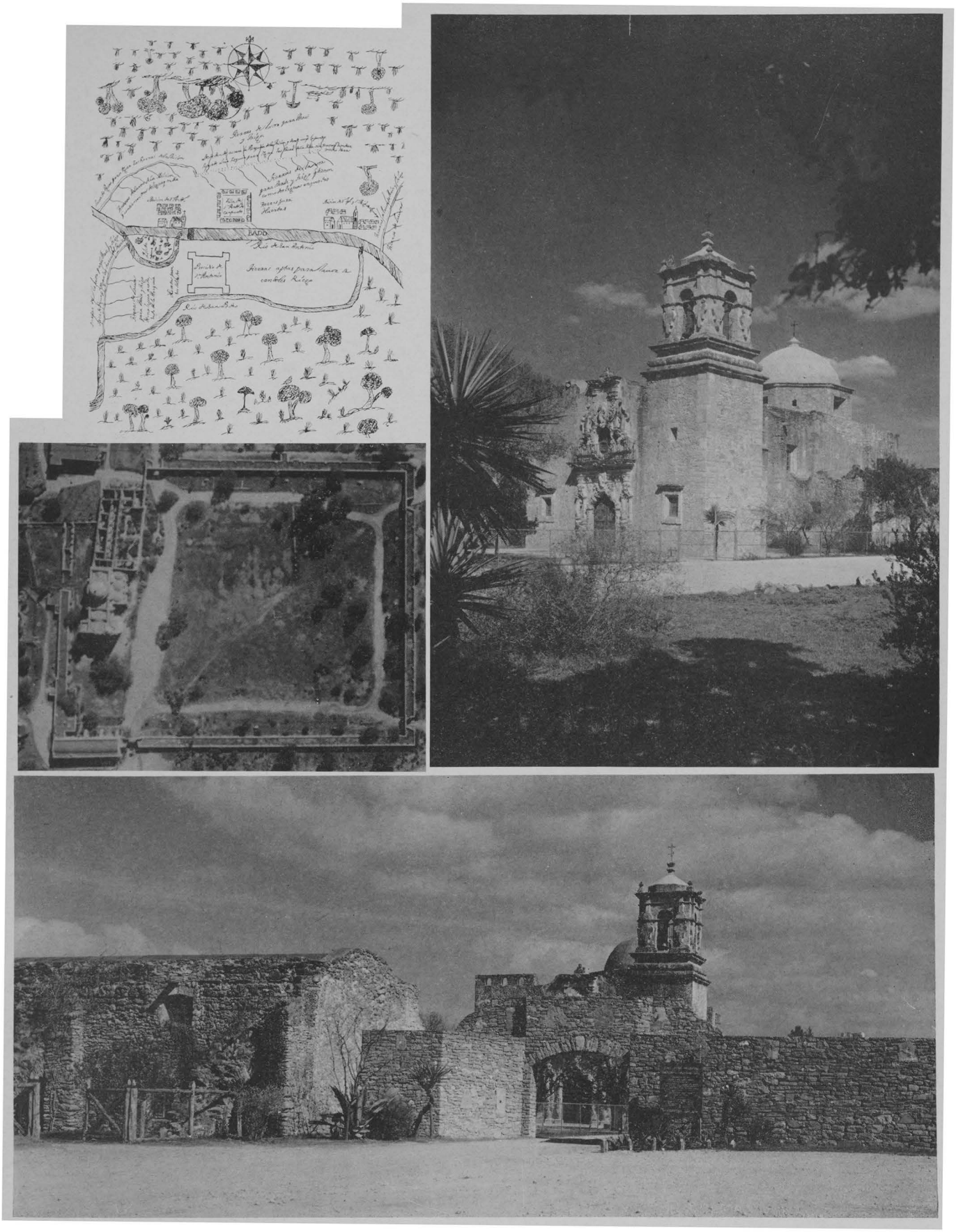

PLATE I

(Left to right)

1. Map of 1730, Presidio of San Antonio, Missions San Antonio and San Jose. 2–3–4. Mission San Jose de Aguayo, San Antonio, Texas.

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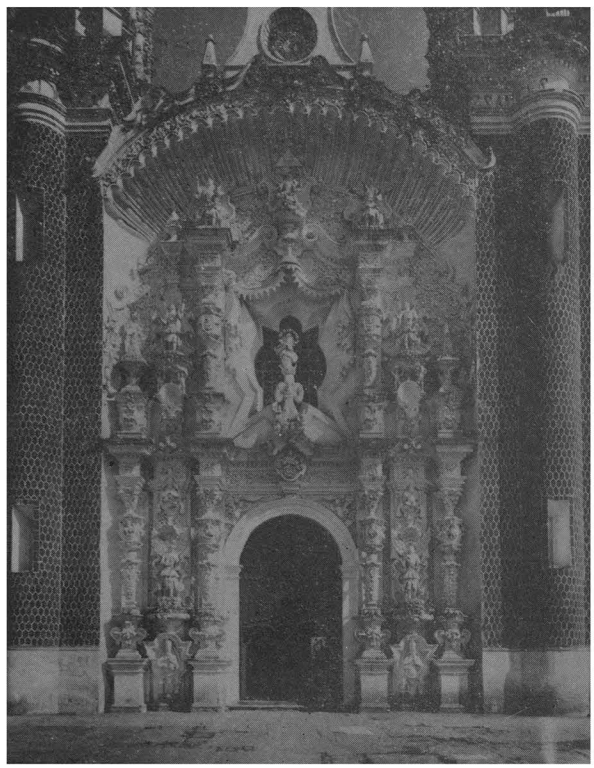

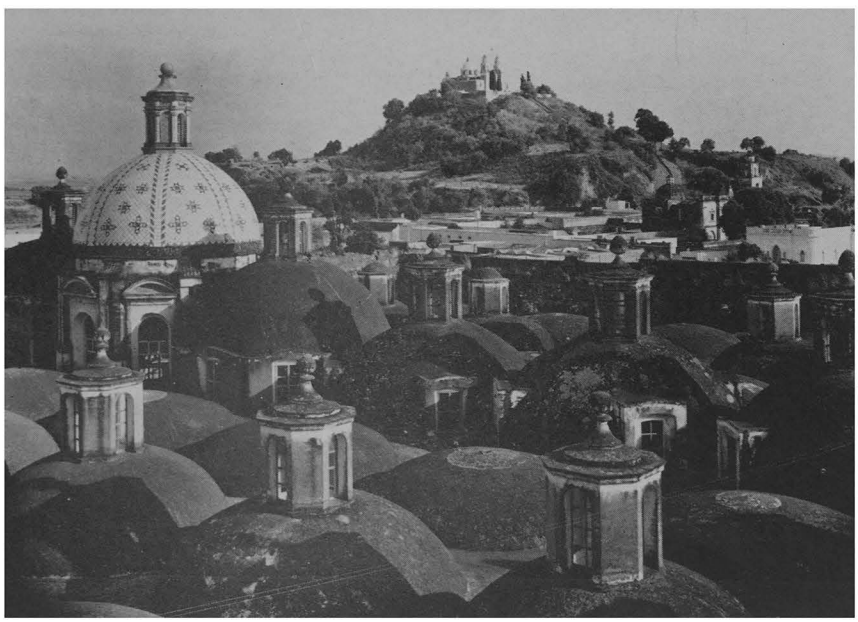

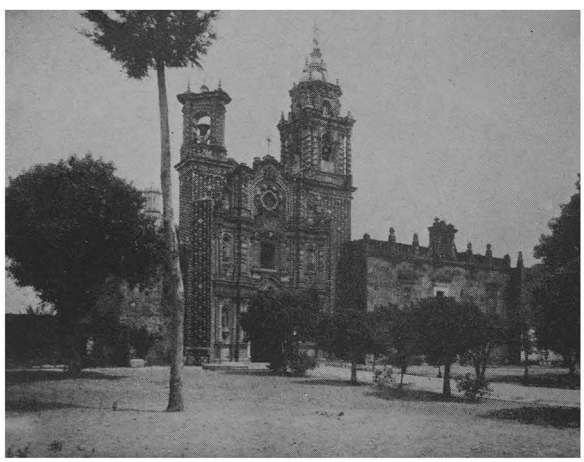

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PLATE 2

5–6. San Francisco Ecatepec of Puebla, Mexico. 7. Cholula, Mexico. 8. Santuario de Ocotlan, Tlaxala, Mexico.

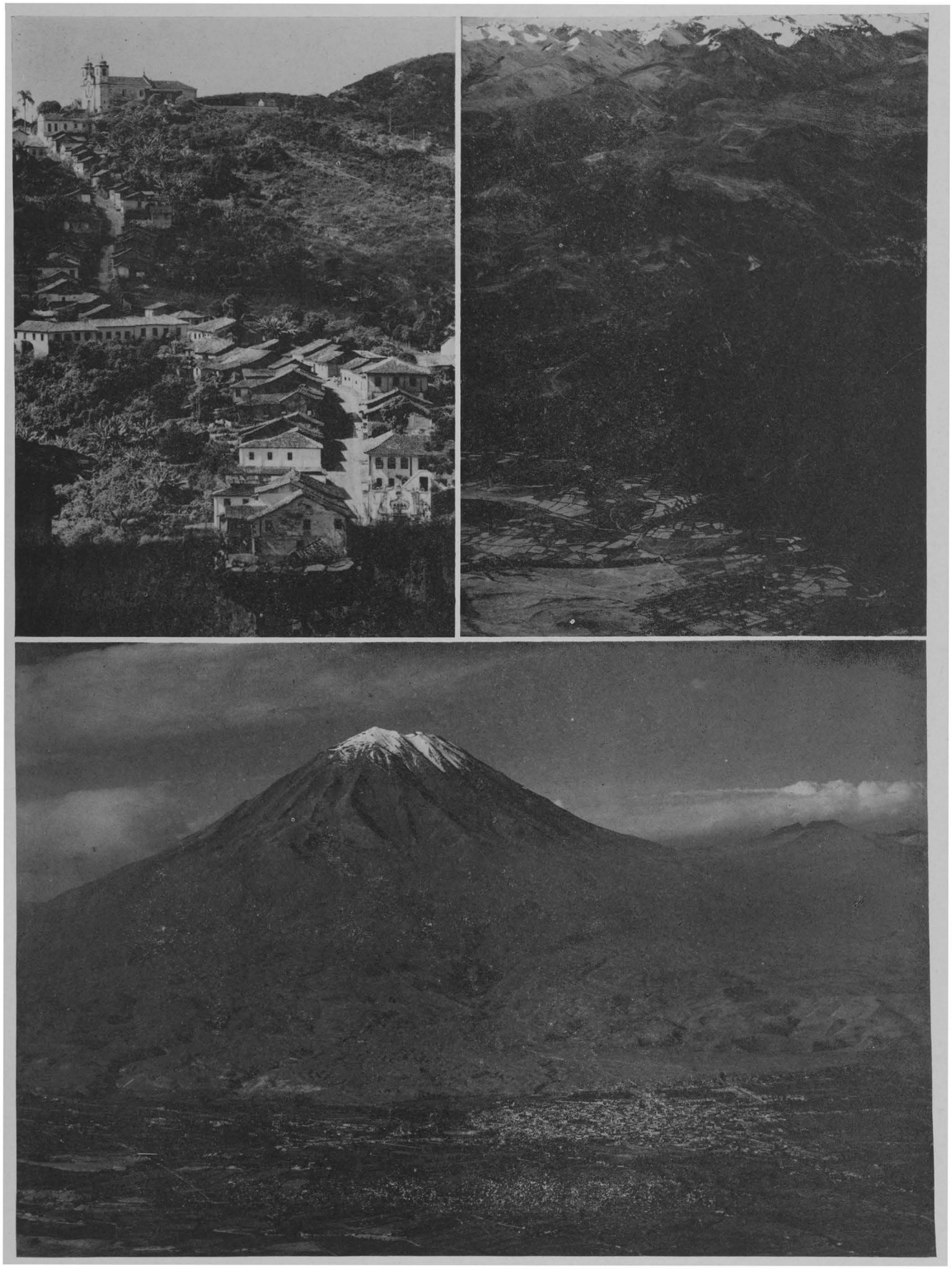


PLATE 3

(Left to right)

9. Village on hilltop, Brazil. 10. Colca River Valley in the Andes, Peru. 11. El Misti, in the Andes, Peru.

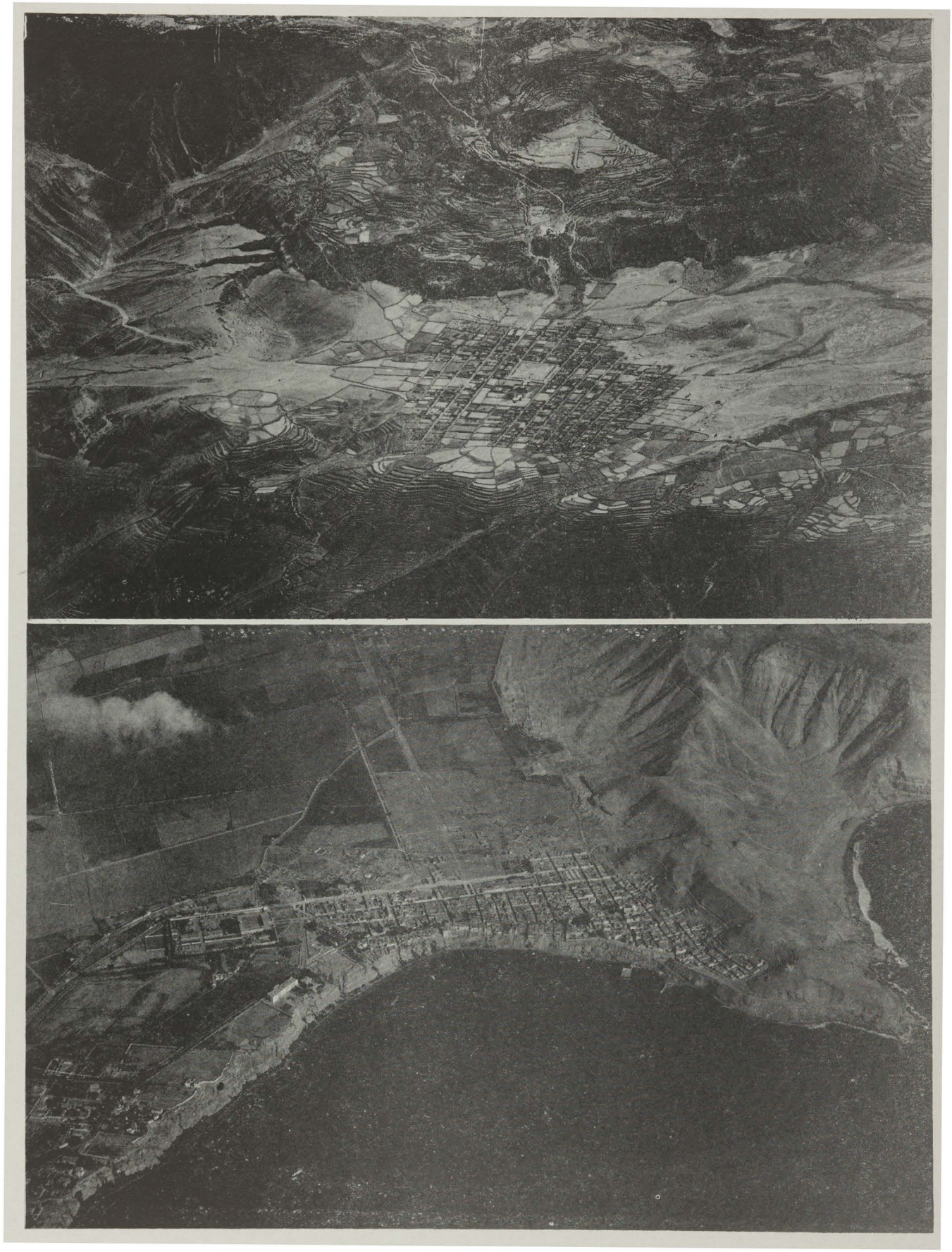
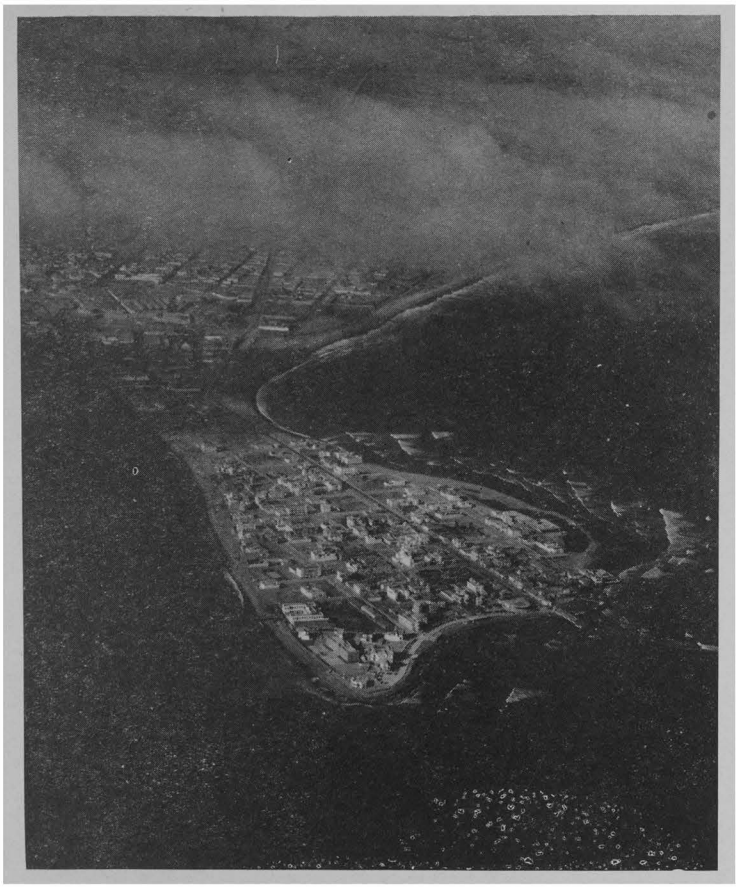
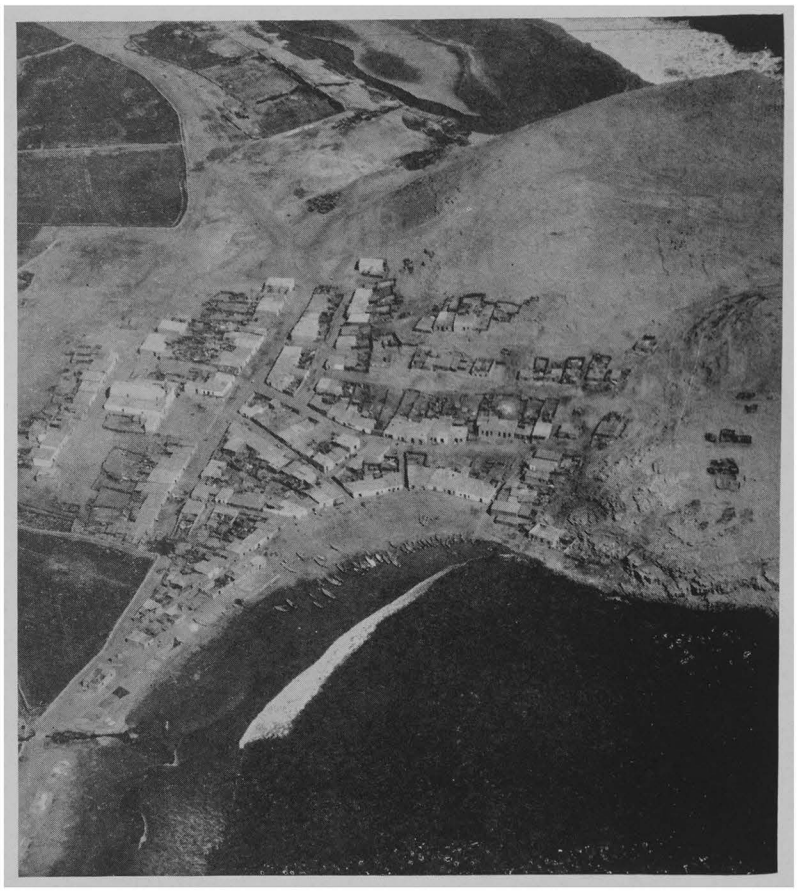


PLATE 4

12. Typical Spanish American village in Colca River Valley, Peru. 13. Chorillons, Peru.





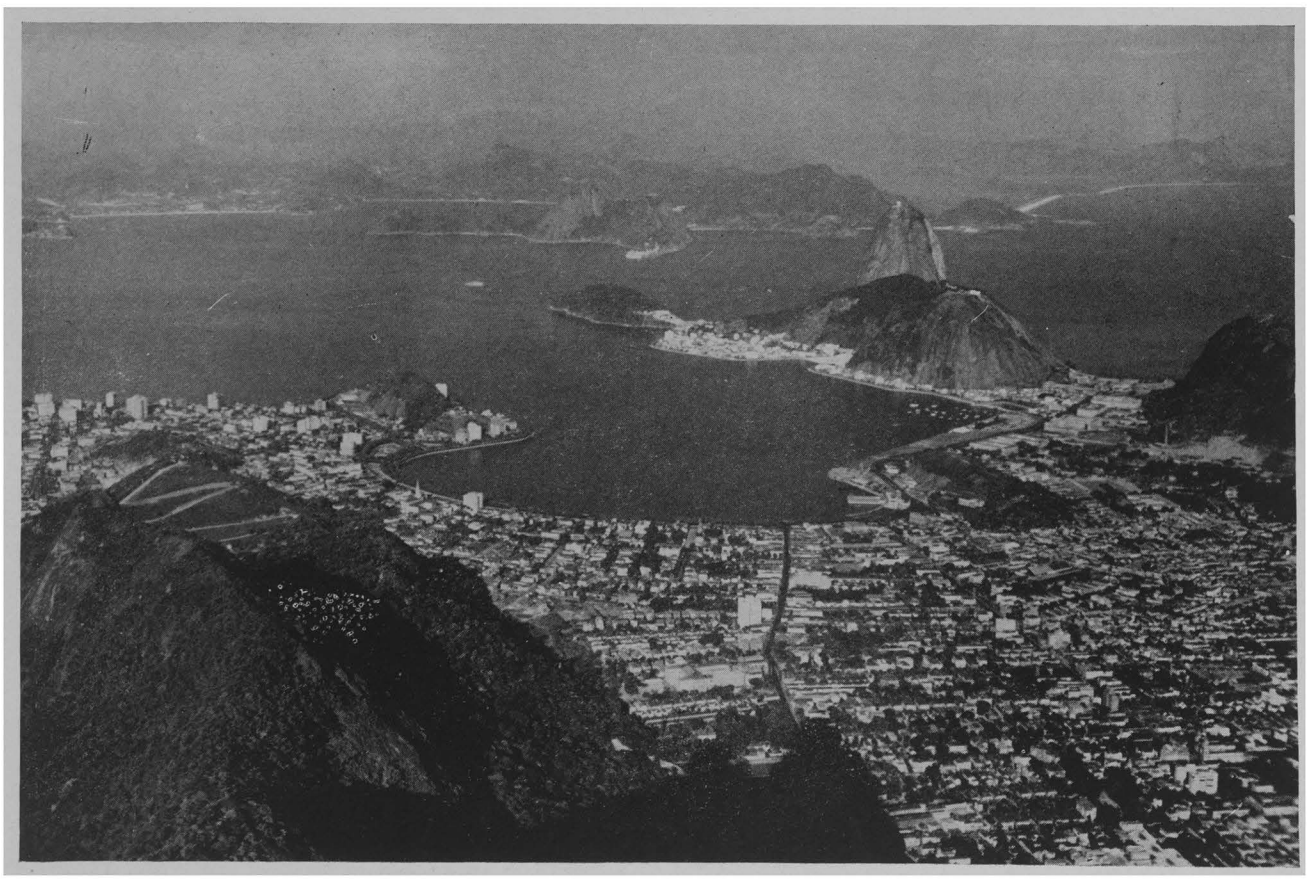
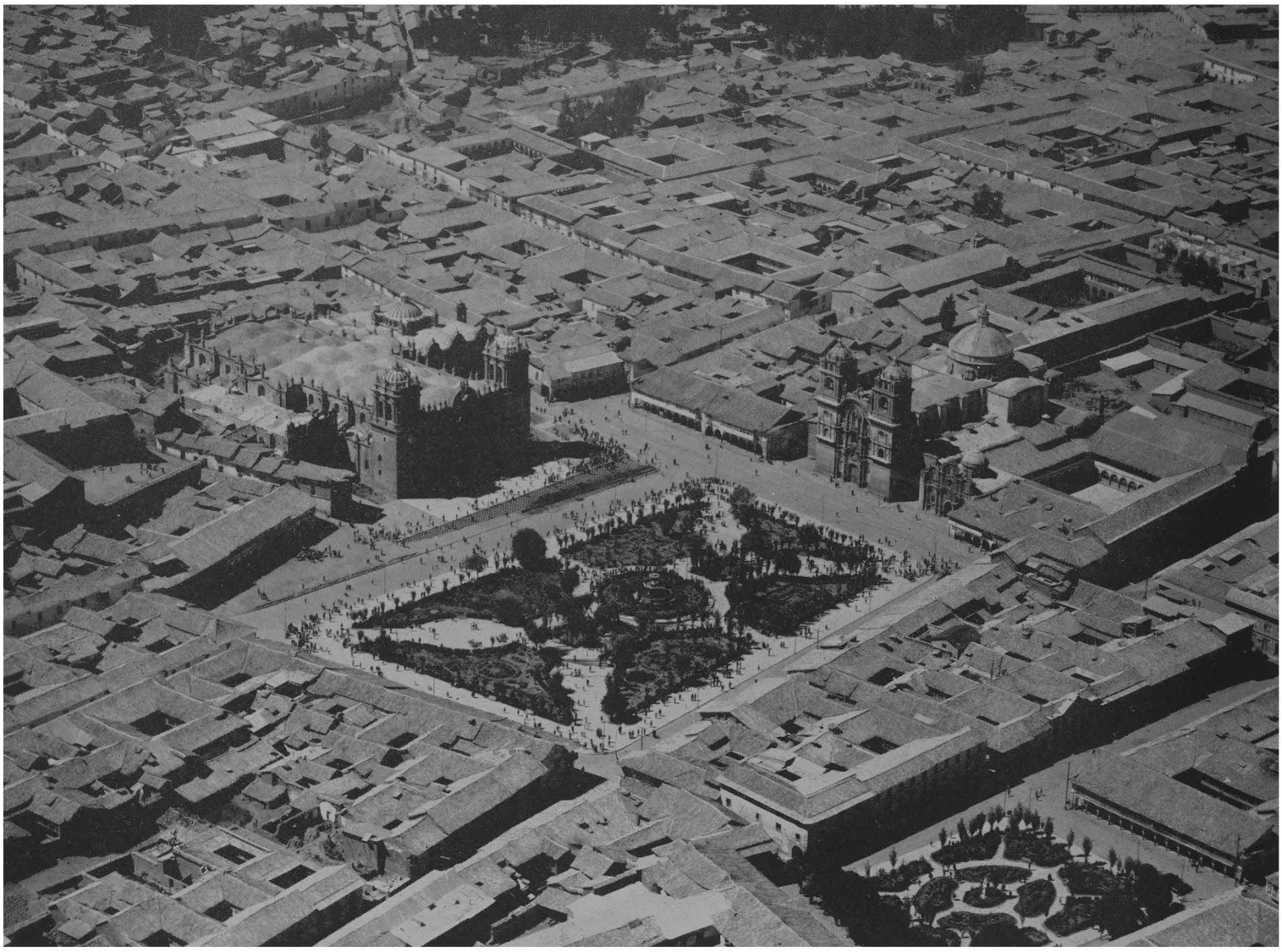


PLATE 5

(Left to right)

14. La Punta near Callao, Peru. 15. Carquin Bay. 16. Rio de Janeiro.



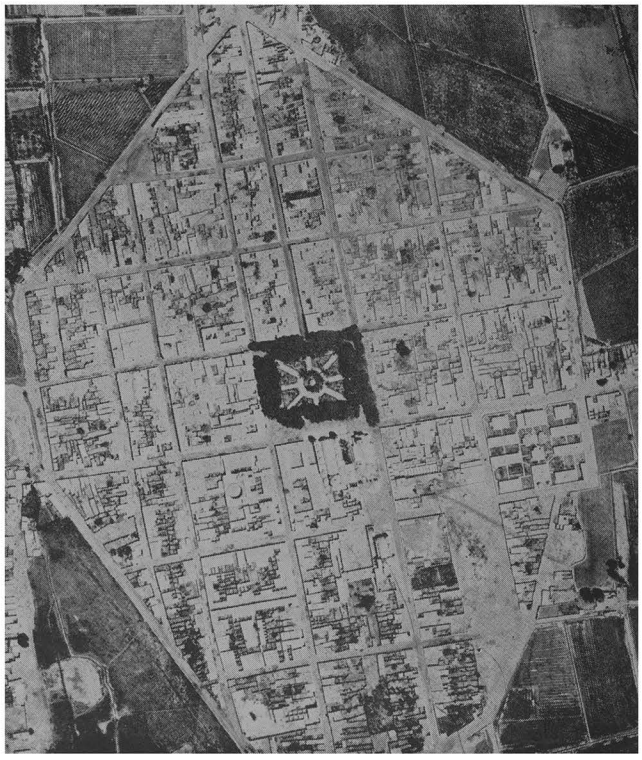
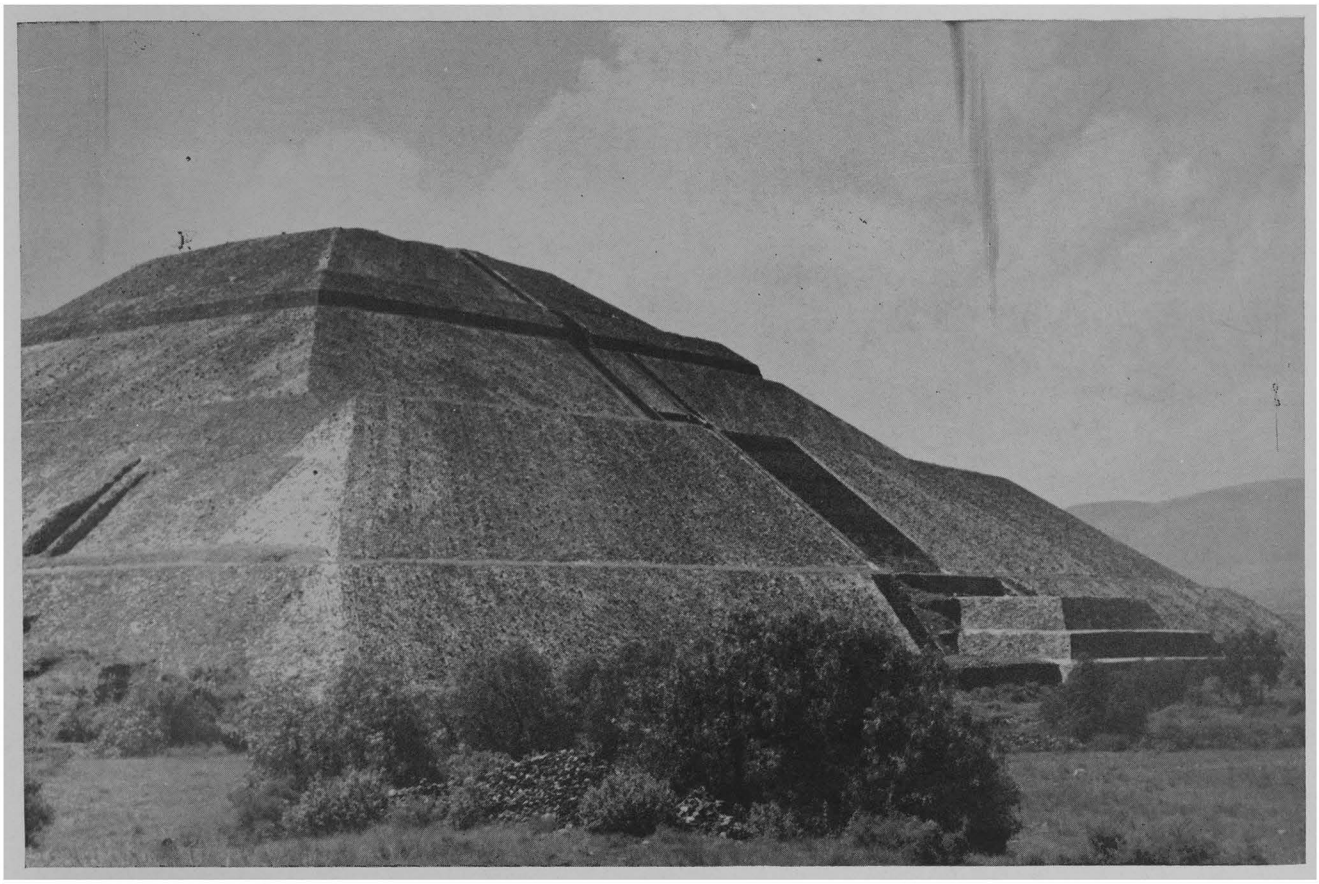
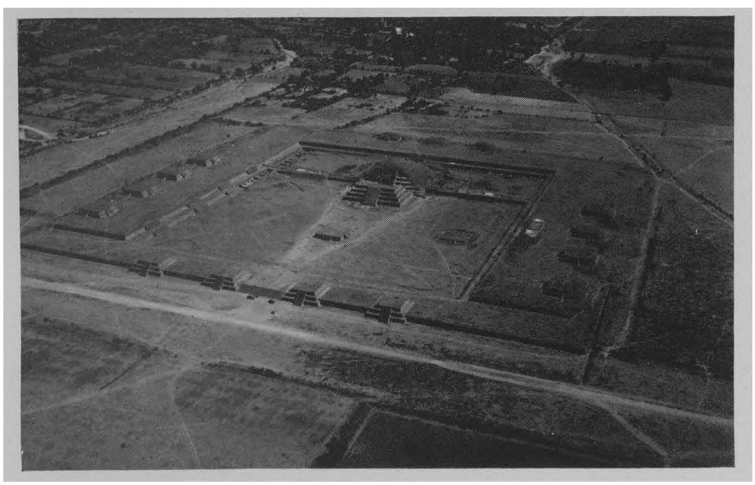


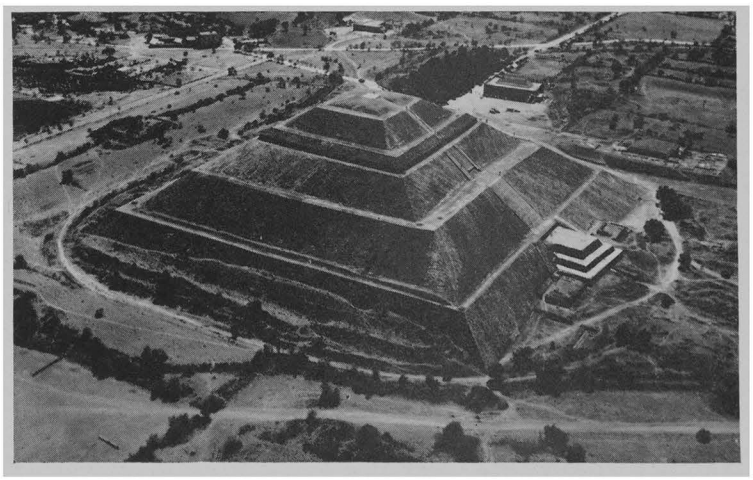
PLATE 6

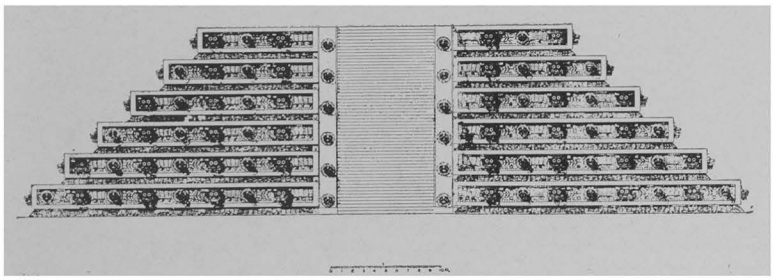
(Left to right)

17. Ancient Cuzco, Peru. 18. Lima, Peru. 19. The Pueblo of Pisco, one of the oldest towns in Peru.









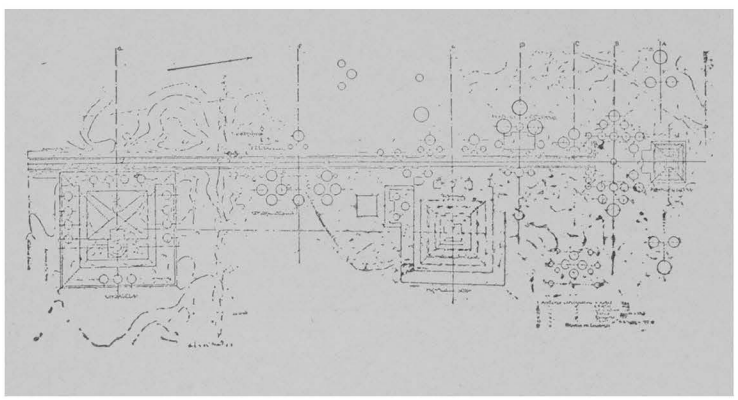
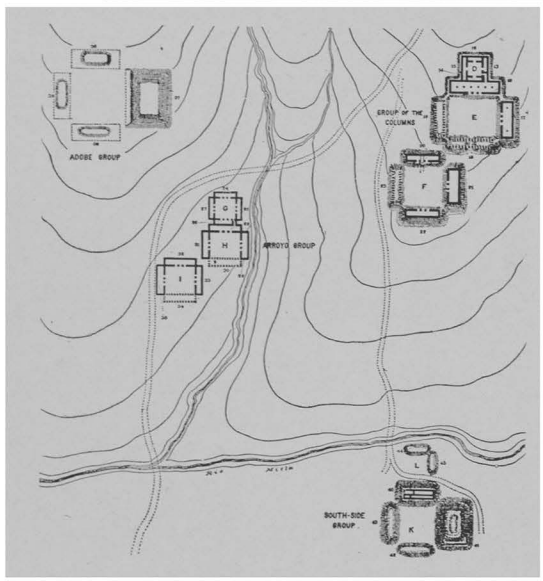
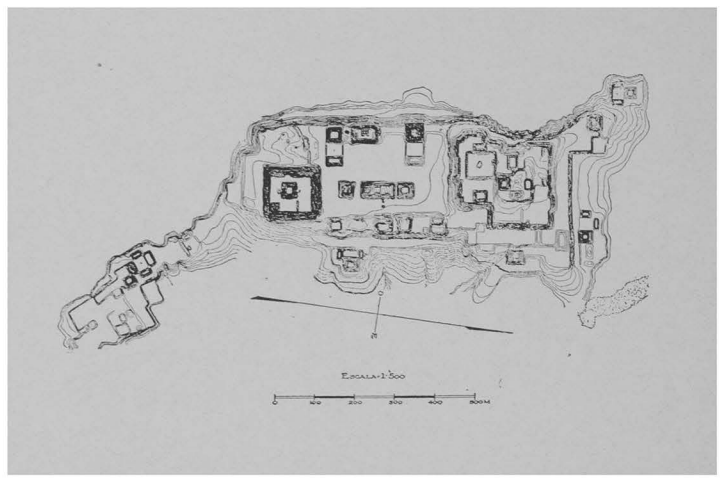


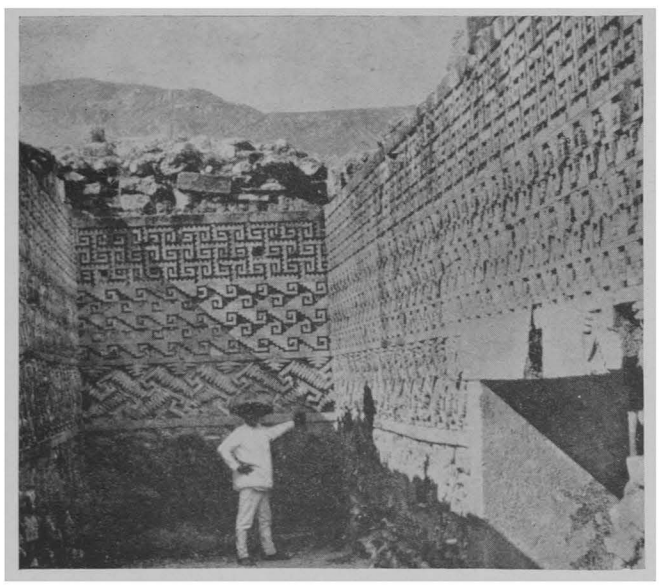
PLATE 7

(Left to right)

Teotihuacan, Mexico: 20. Pyramid of the Sun. 21. Temple of Quetzalcoatl. (Ph: Fairchild from Compania Aerofoto.) 22. Pyramid of the Sun. (Ph: Fairchild from Compania Aerofoto.) 23. Temple of Quetzalcoatl. Reconstruction of central Pyramid. 24. Map with Sun Pyramid, Moon Pyramid, and Citadel.







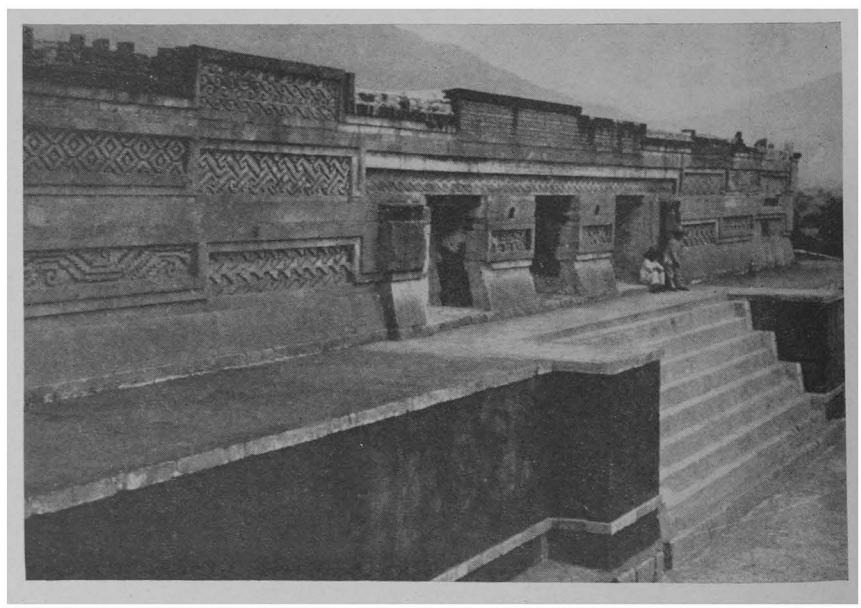
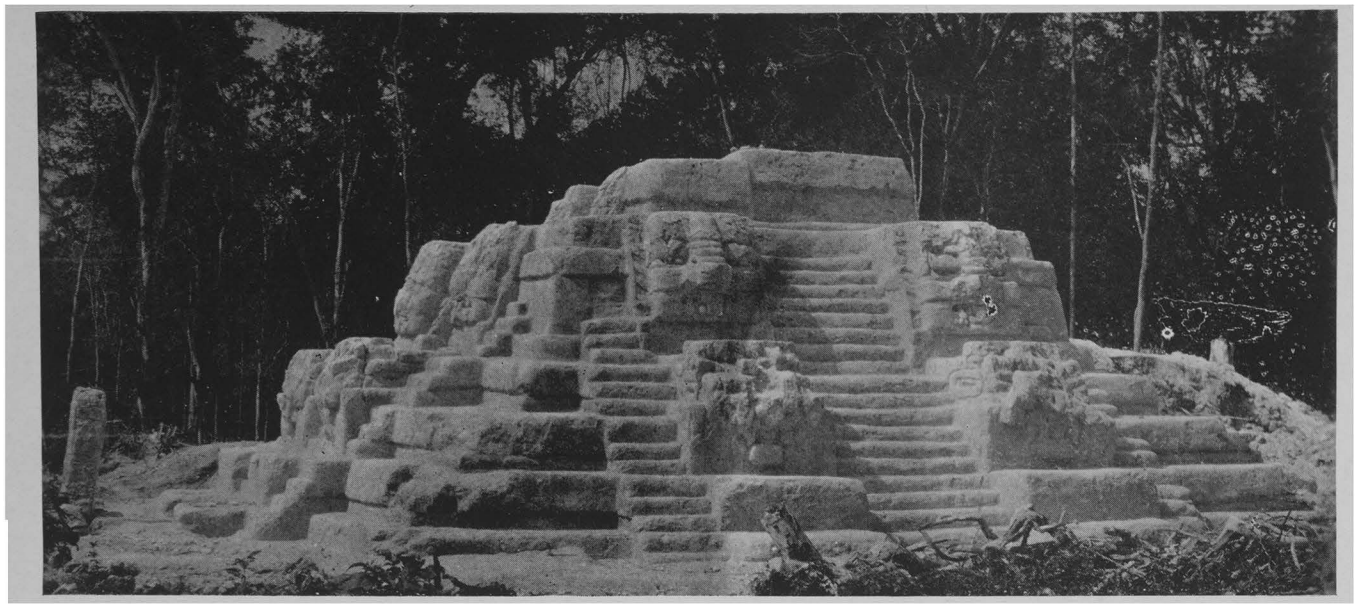
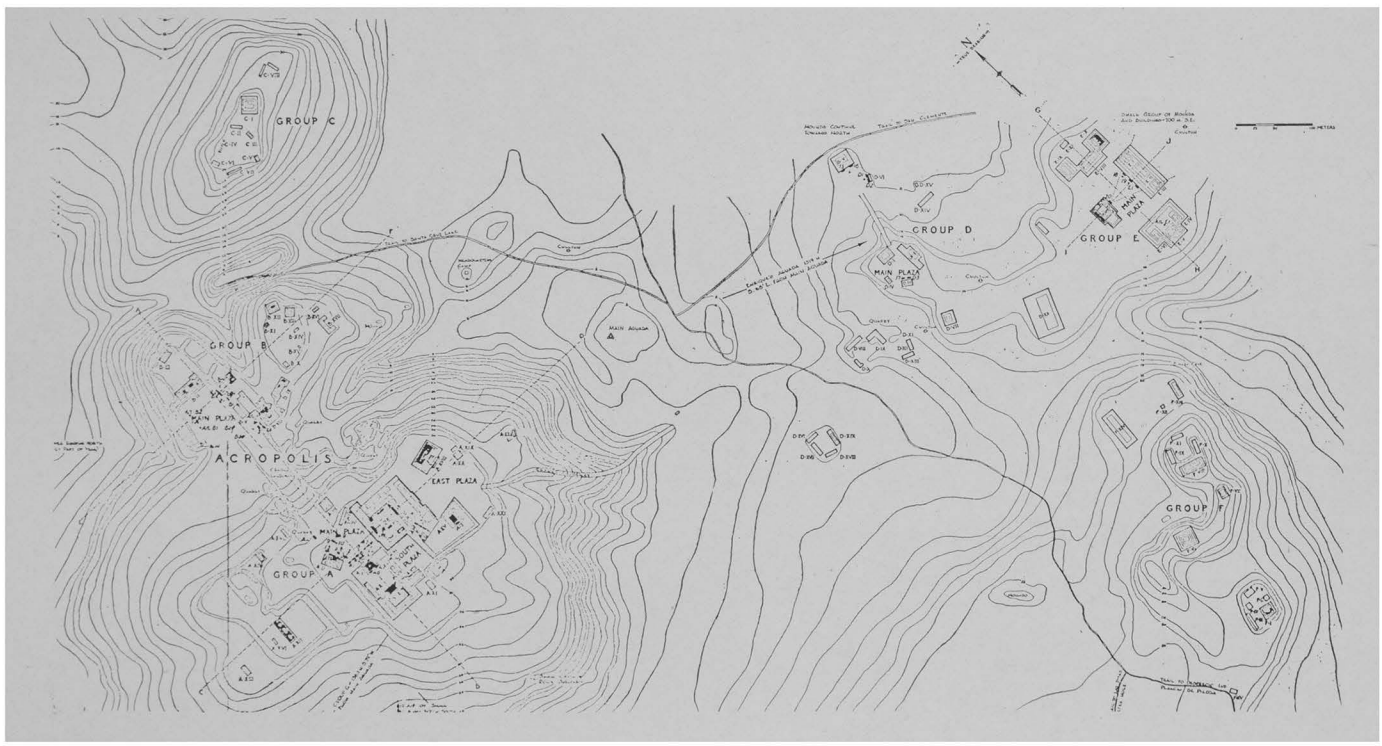


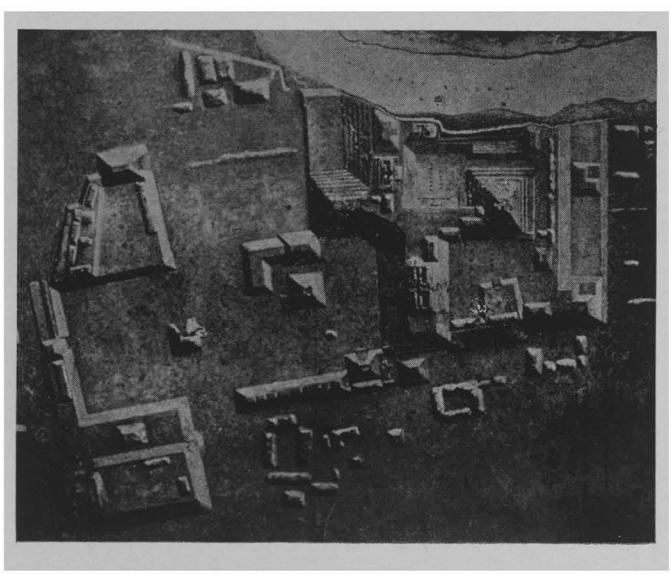
PLATE 8

(Left to right)

Monte Alban, Mexico: 25. General view. 26. General layout. Mitla Oaxaca, Mexico: 27. General layout. 28. West hall of the Palace of Columns. 29. Restored front of the Palace of Columns.







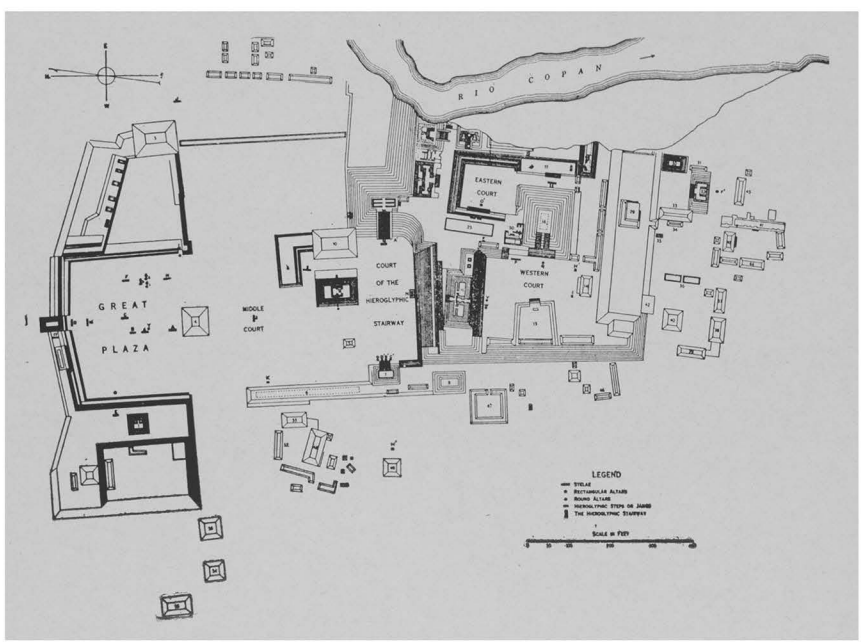


PLATE 9

(Left to right)

30. Uaxactun, Guatemala. 31. Map of Uaxactun. 32. Plan of Copan, Honduras. 33. Model of Copan.

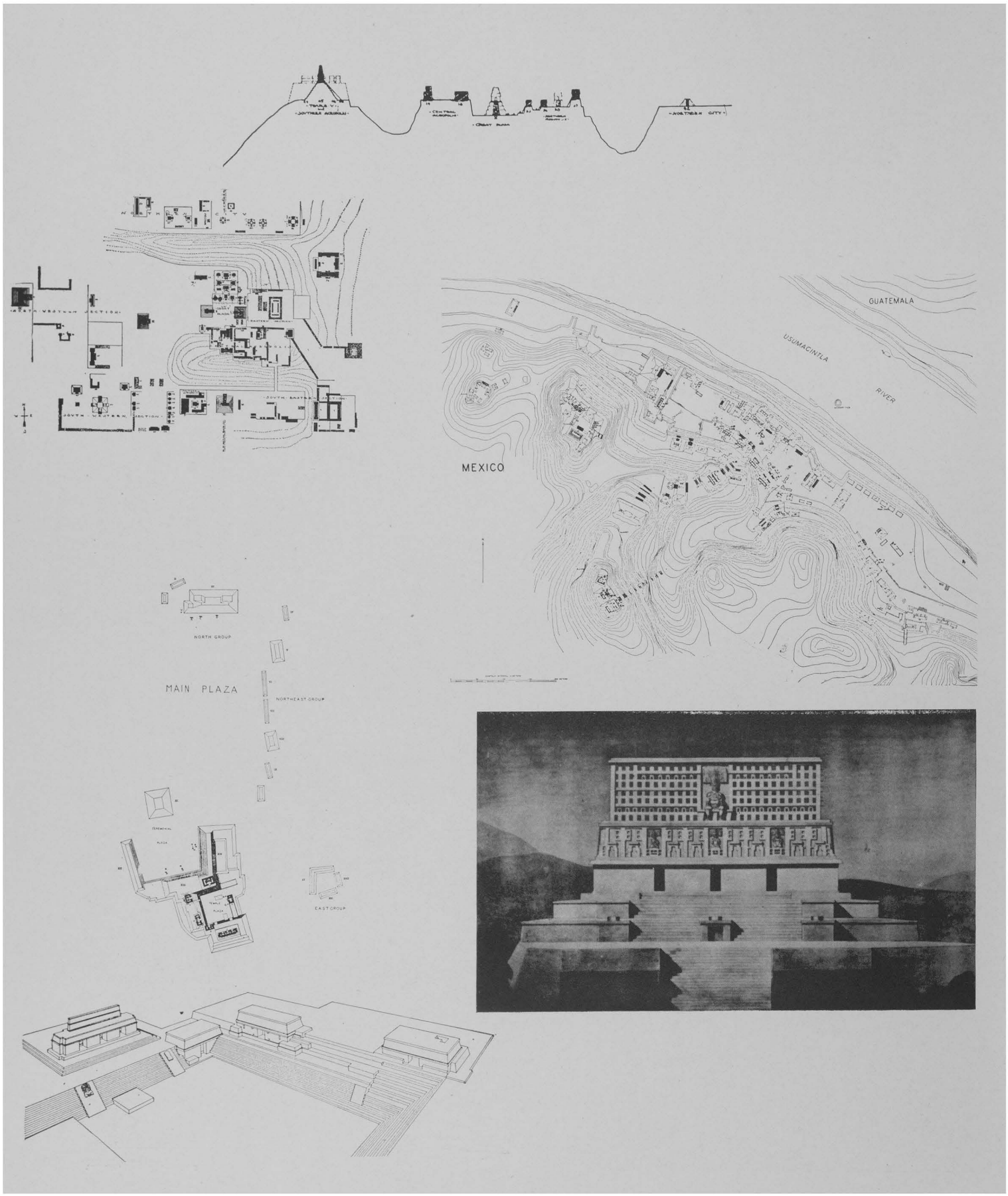
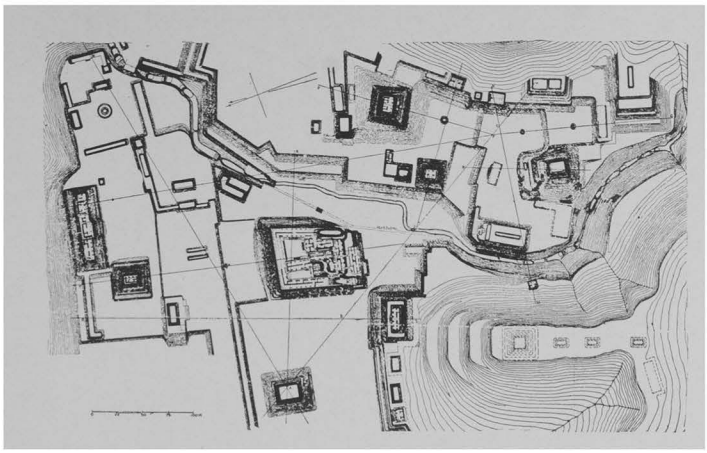
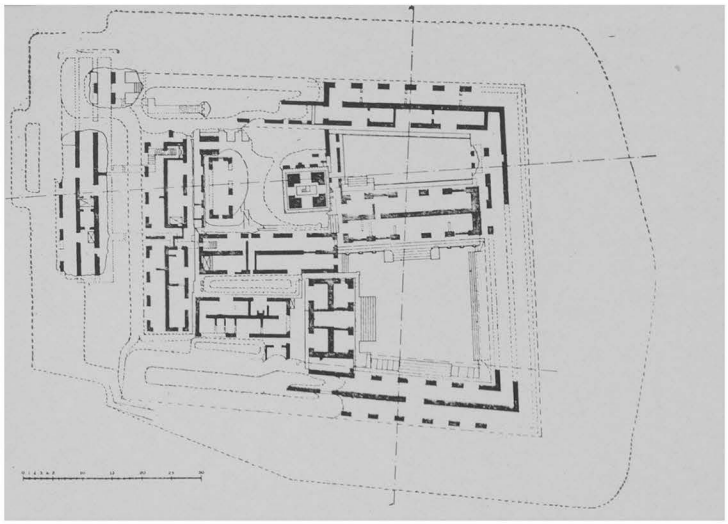


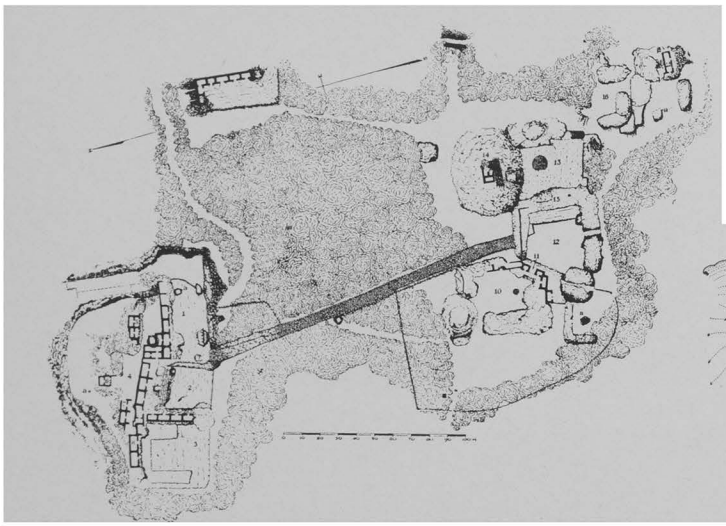
PLATE 10

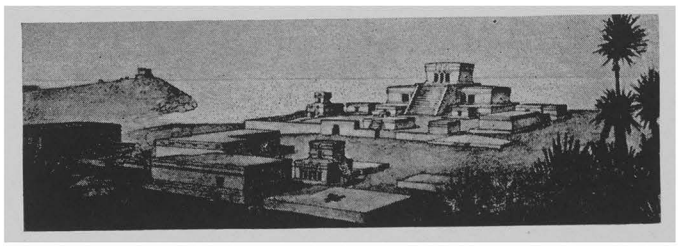
(Left to right)

34–35. Tikal, Guatemala. Plan and section. 36. Yaxchilan, Mexico. 37. Yaxchilan Architectural Restoration of Structure 33. 38. Quirigua, Mexico. 39. Quirigua, Mexico, Architectural Restoration of Structures 1, 2, 3, and 4.









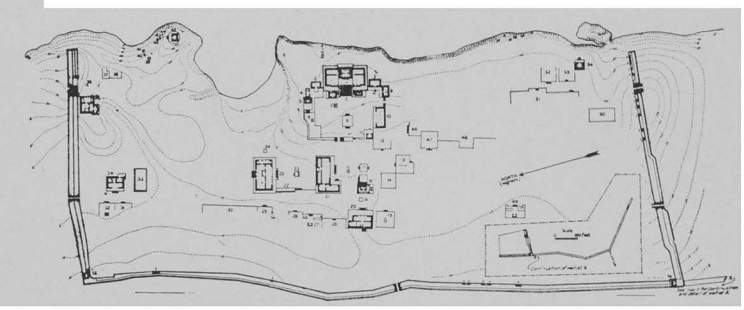
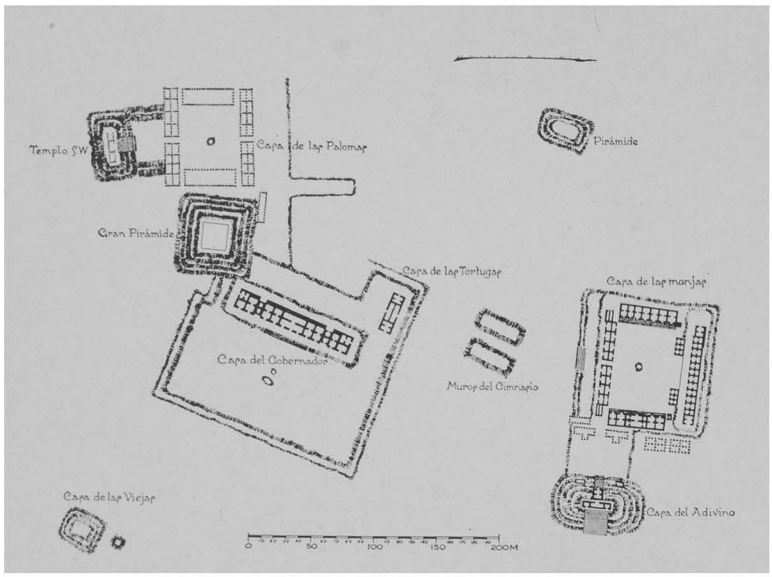
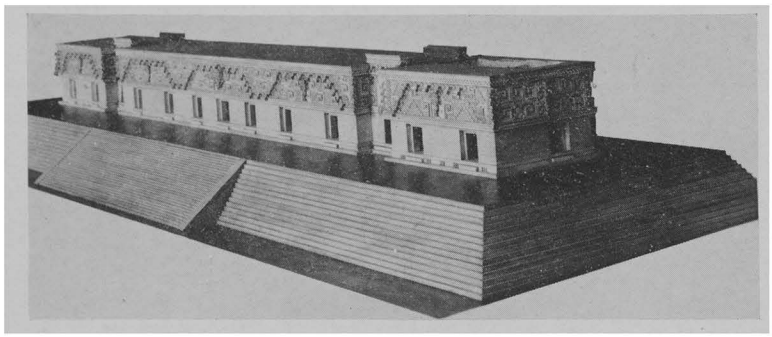


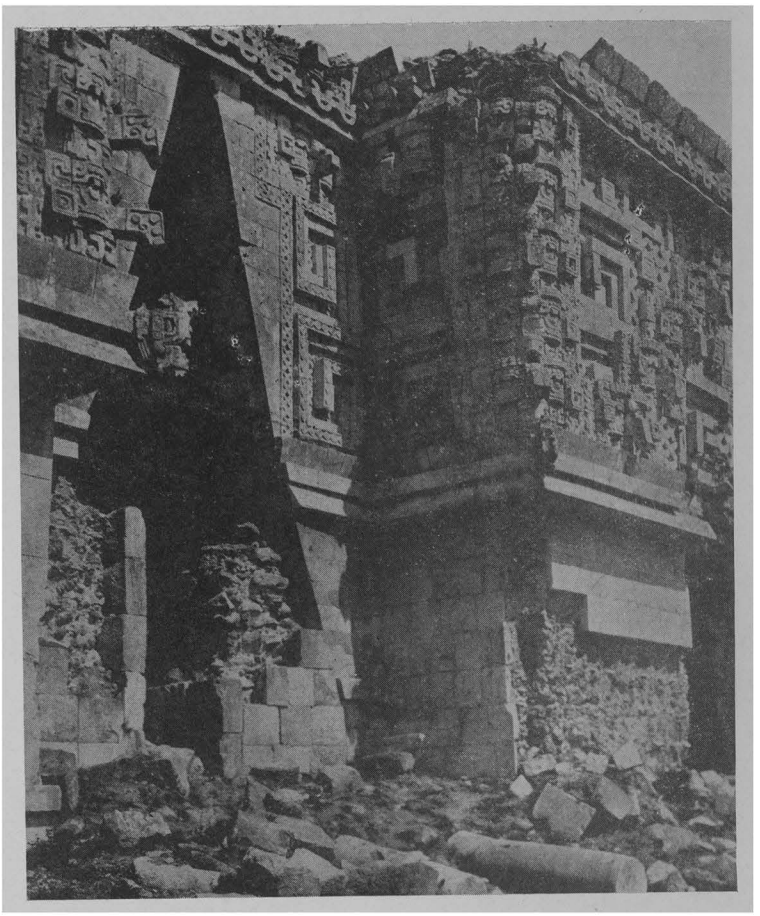
PLATE 11

(Left to right)

Palenque, Chiapas, Mexico: 40. General layout. 41. Plan of Palace. 42. Labna, Yucatan, Mexico: General layout. Tulum, Yucatan, Mexico: 43. Restoration. 44. General layout. 45. Aerial view. (Ph: Fairchild **Aerial Surveys.)**







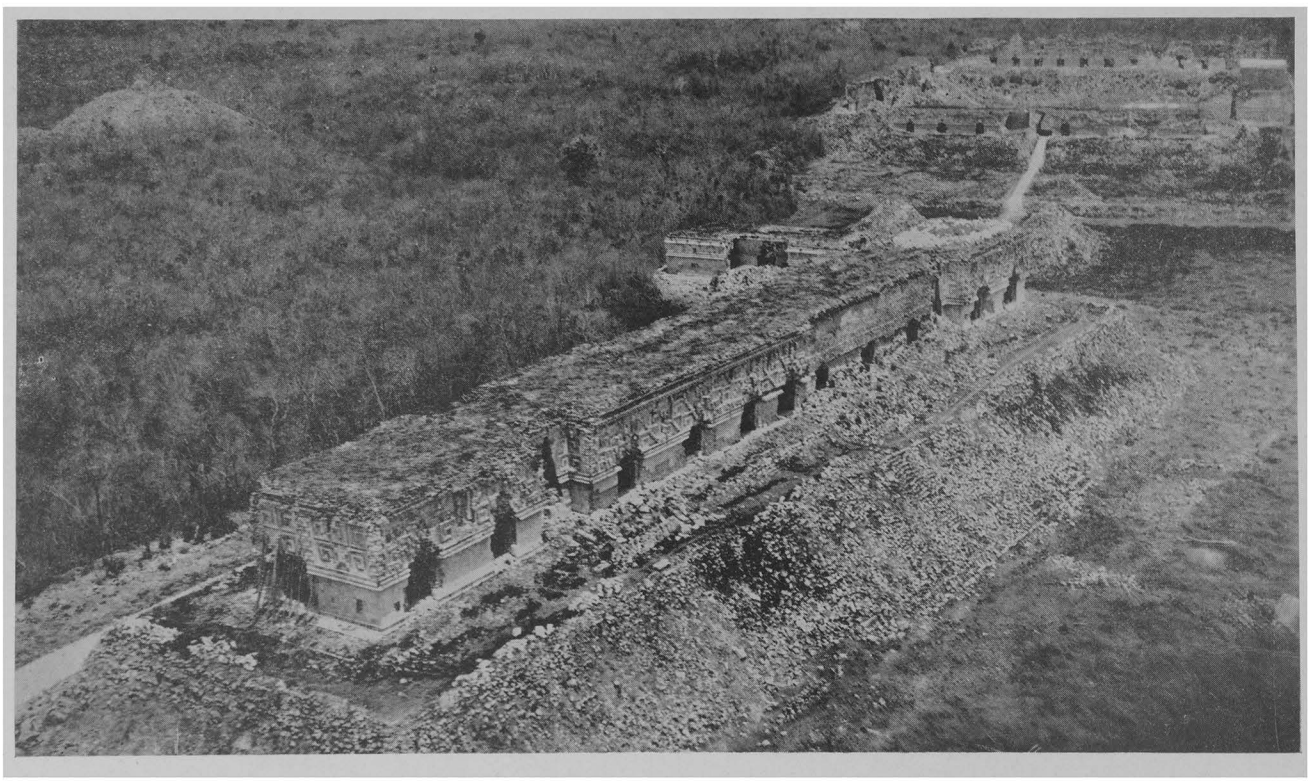


PLATE 12

(Left to right)

Uxmal, Yucatan, Mexico: 46. General layout. 47. Model of the Palace of the Governors. 48. **Triangular** Arch. Palace of the Governors. 49. Aerial view of Palace of the Governors. (Ph: Fairchild Aerial Surveys.)

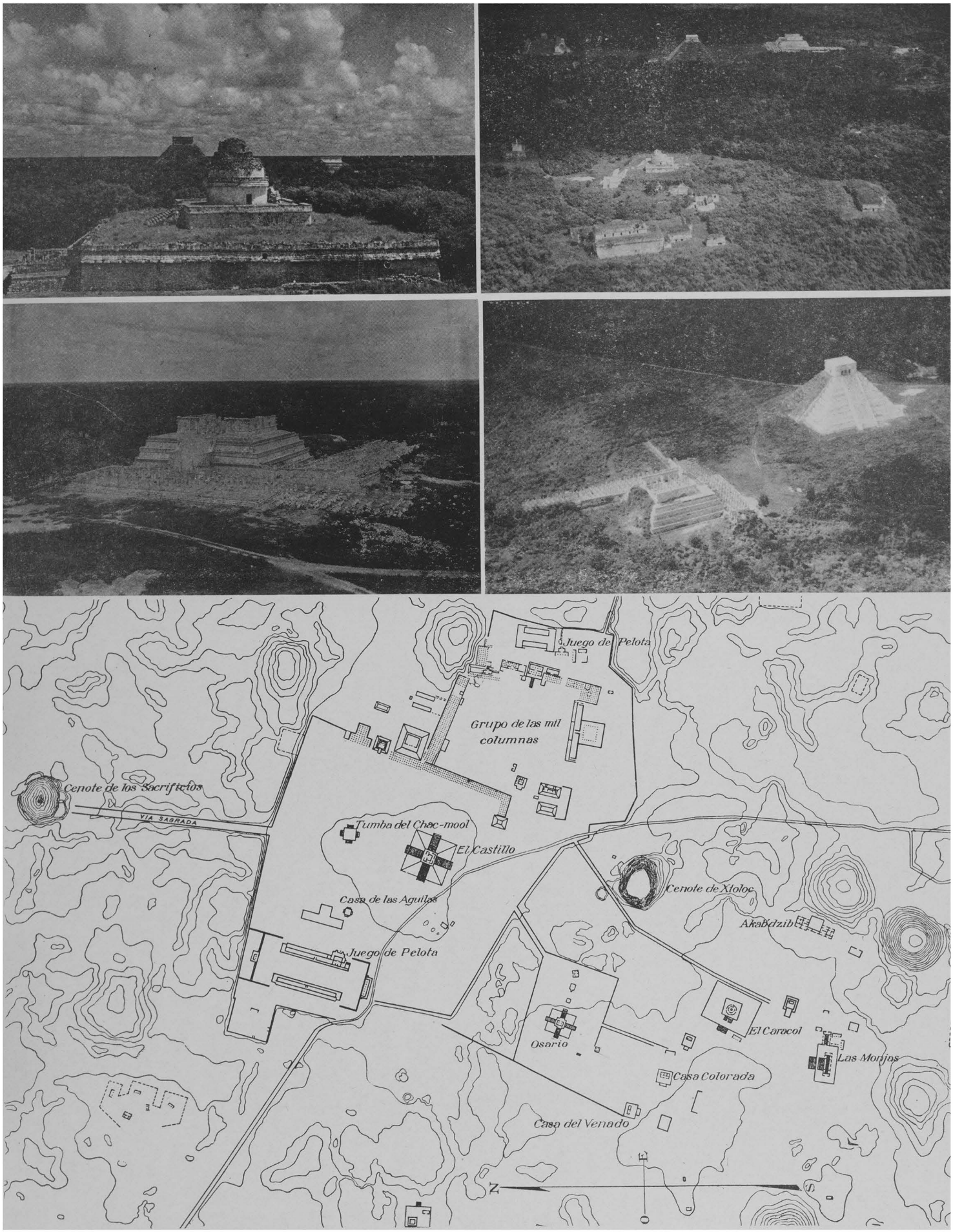
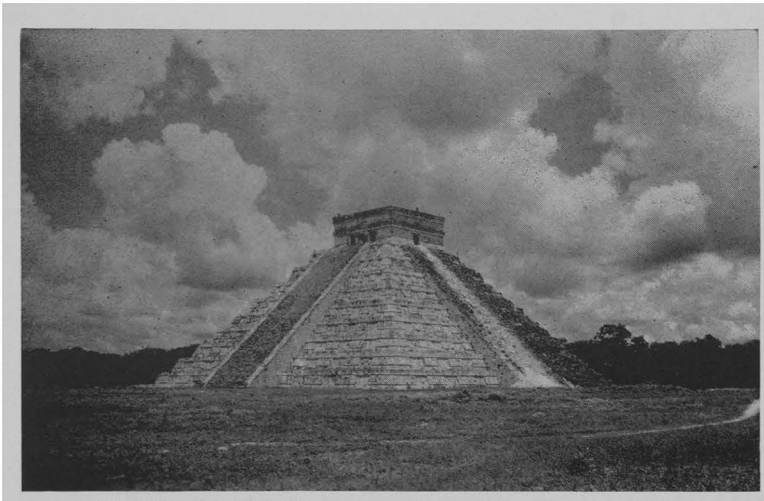
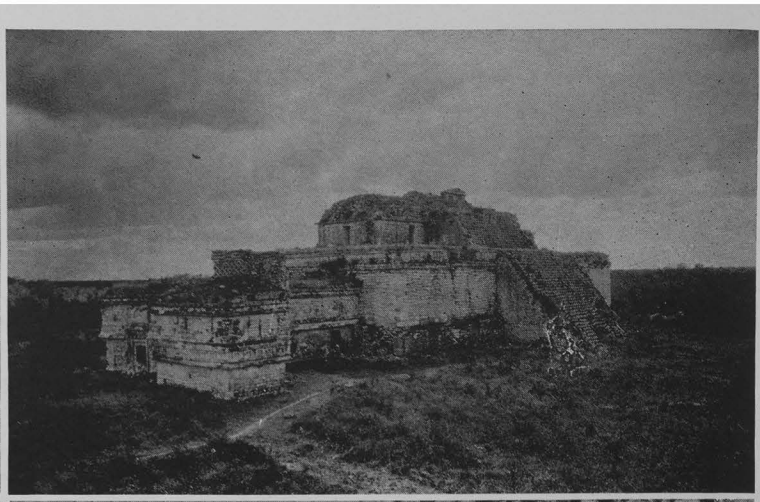


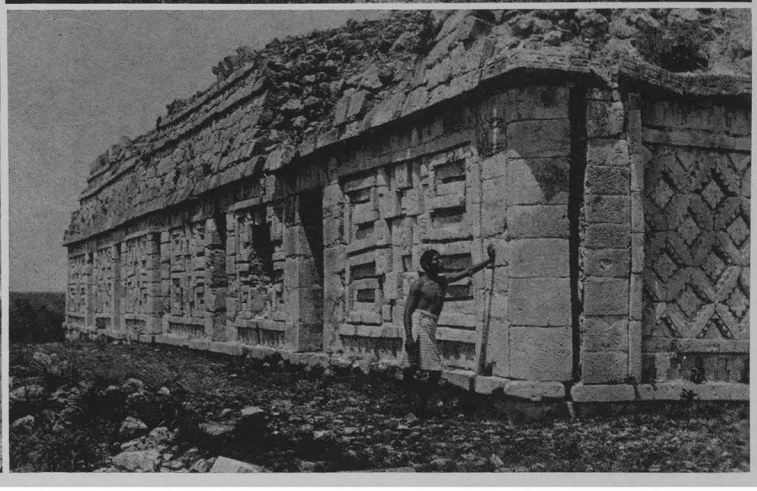
PLATE 13

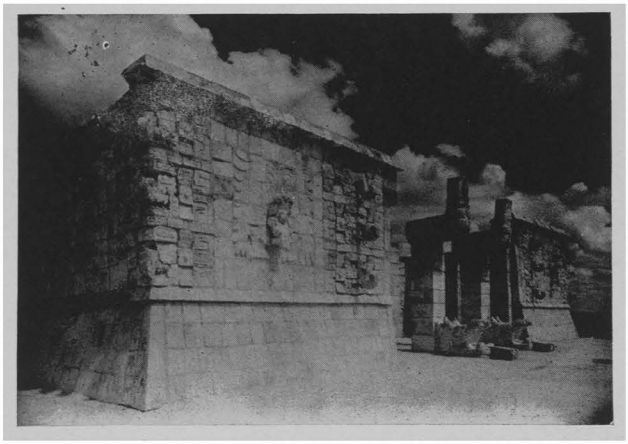
(Left to right)

Chichen Itza, Yucatan, Mexico: 50. Temple of the Three Lintels. 51. Aerial view looking west. 52. Temple of the Warriors. 53. Air view of the Temple of Warriors and El Castillo from left to right. 54. General layout.









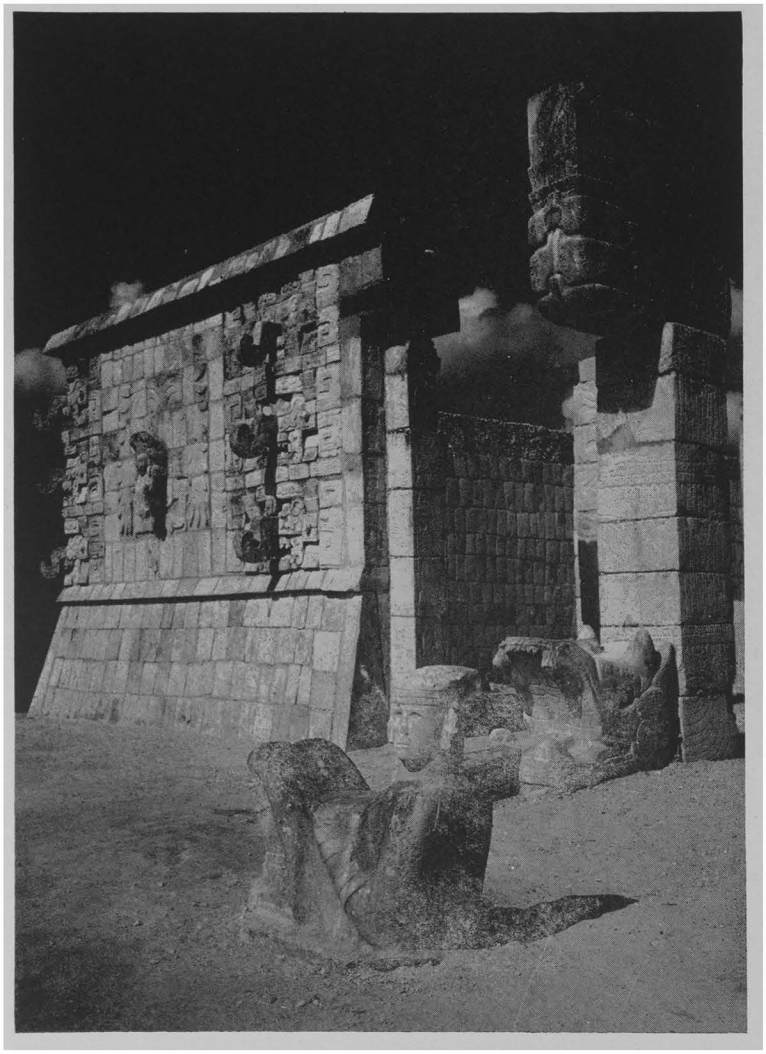
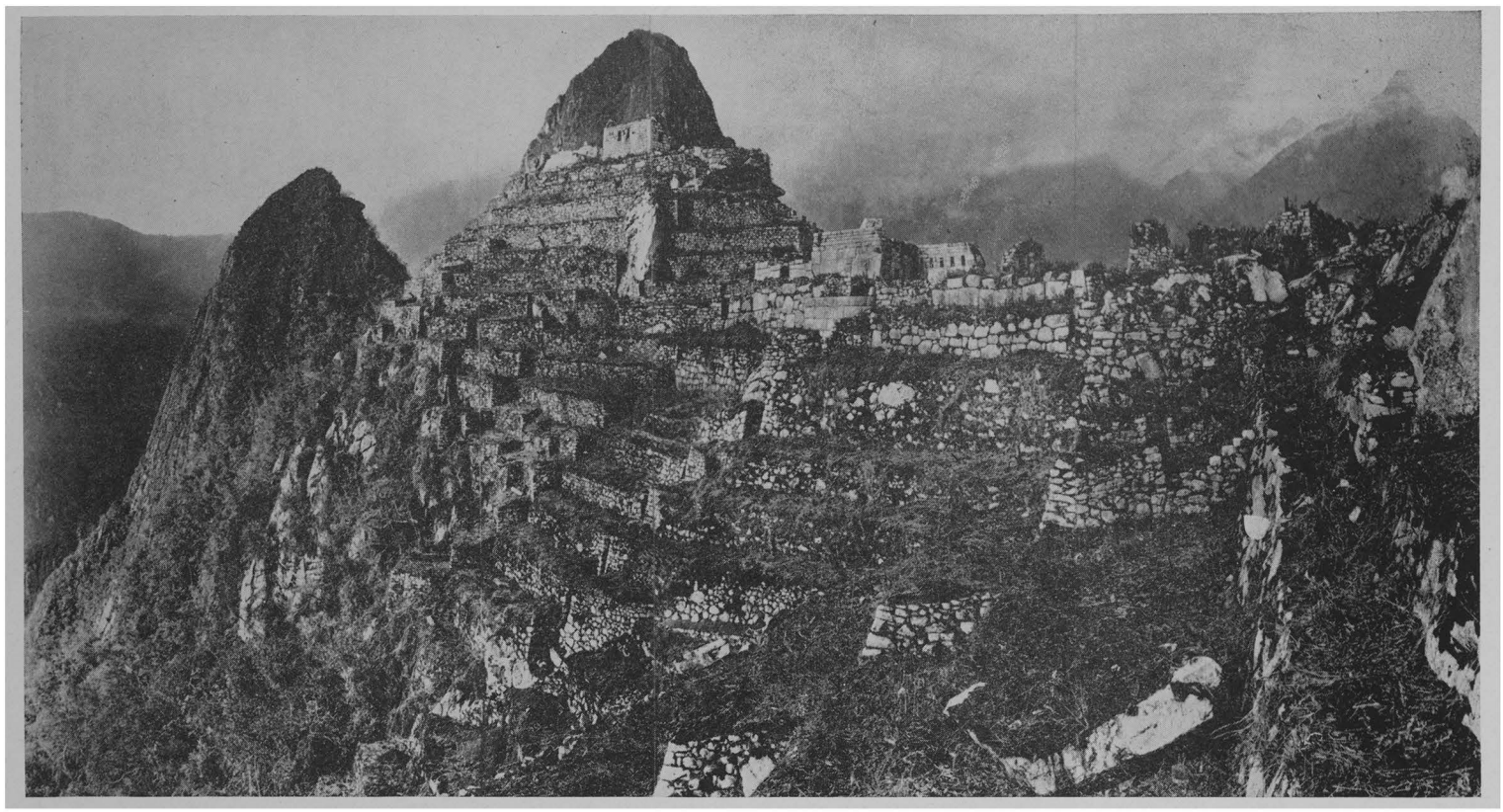


PLATE 14

(Left to right)

Chichen Itza, Yucatan, Mexico: 55. El Castillo from NE. 56. The Nunnery taken from mound NE. 57. N. Colonnade from Temple of the Warrior's Pyramid. 58. Nunnery second story. 59. Temple of the Warriors. 60. Temple of the Warriors. Chac Nool and northern Serpent Column.



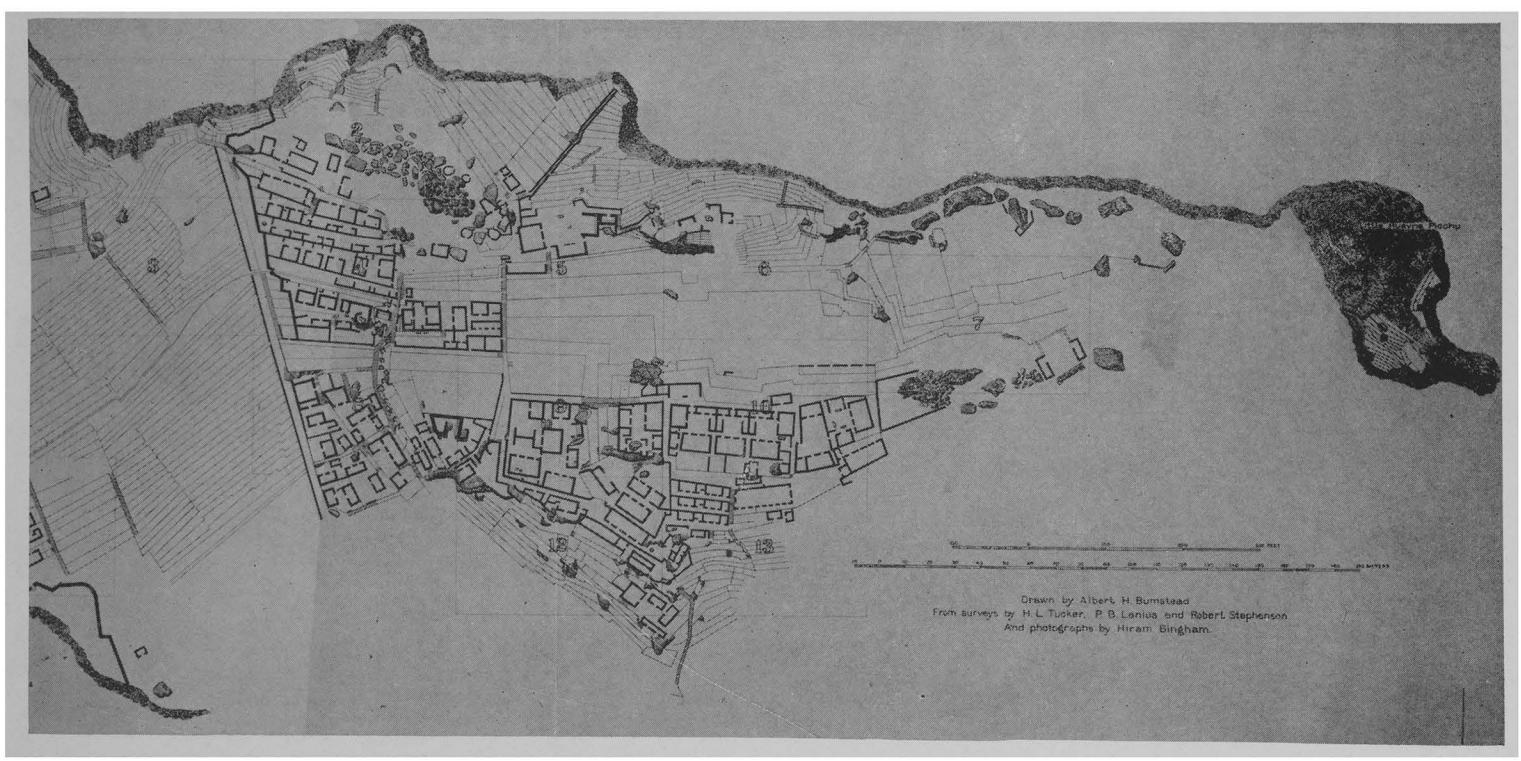


PLATE 15

61. Macchu Picchu, Peru. 62. Map of Ruins.

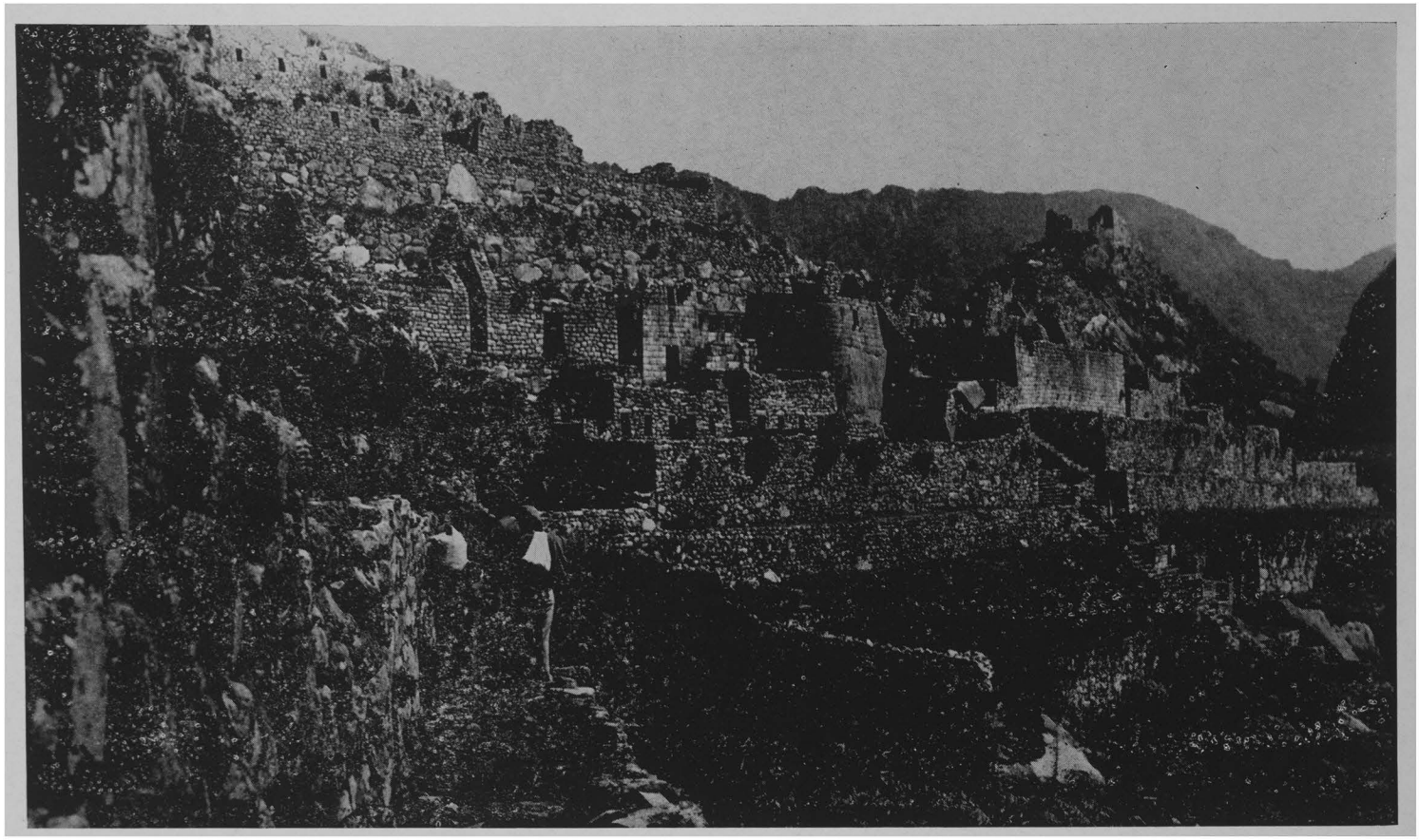
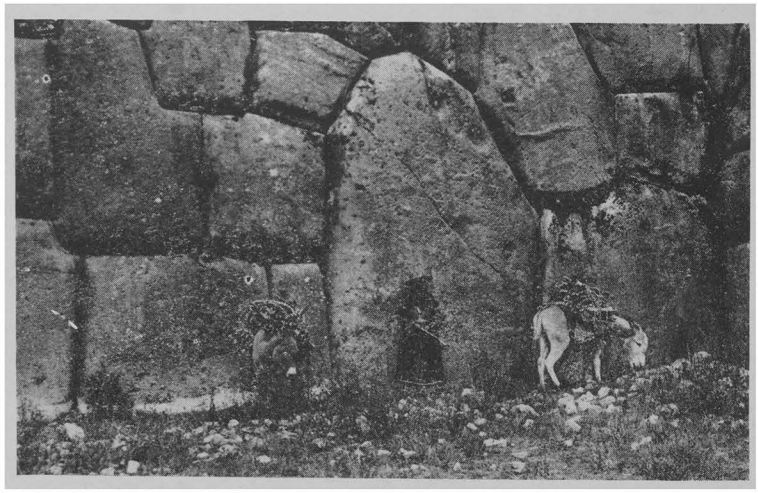


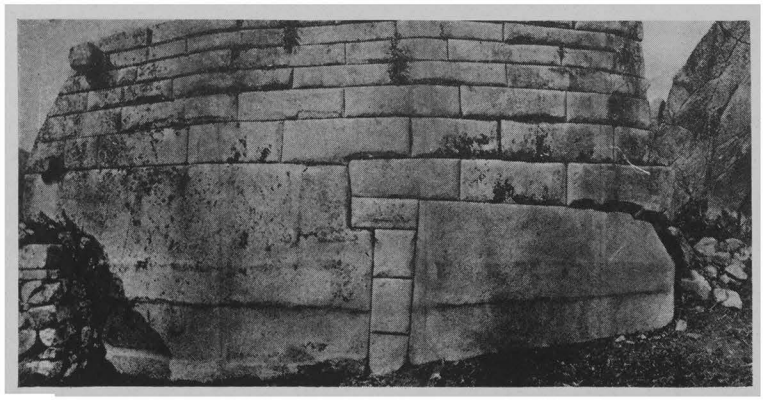
PLATE 16

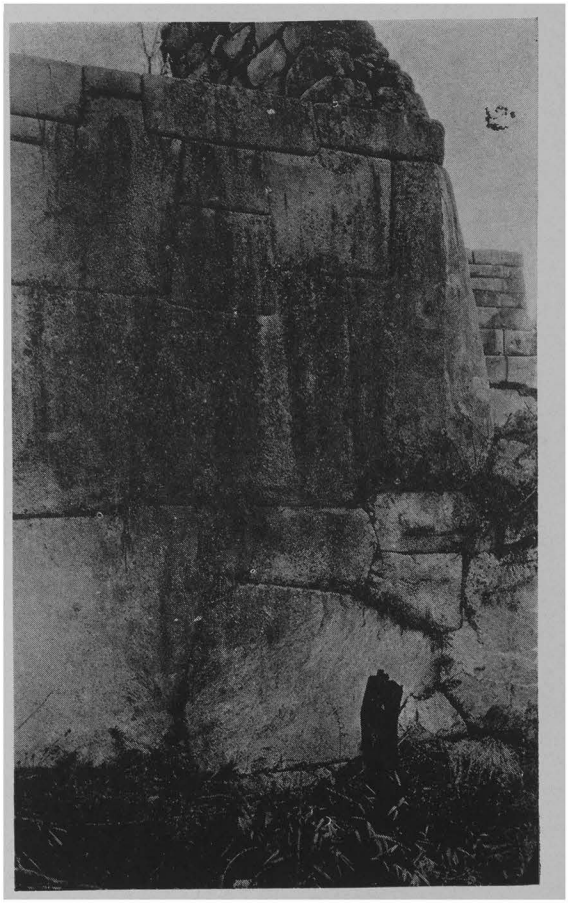
63. Macchu Picchu, Peru. 64. The Sacred Plaza, the heart of Macchu Picchu.

PLATE 17

65. Macchu Picchu, Peru. Temple of the Threee Windows. 66. Map of Macchu Picchu, and Huayna Picchu.







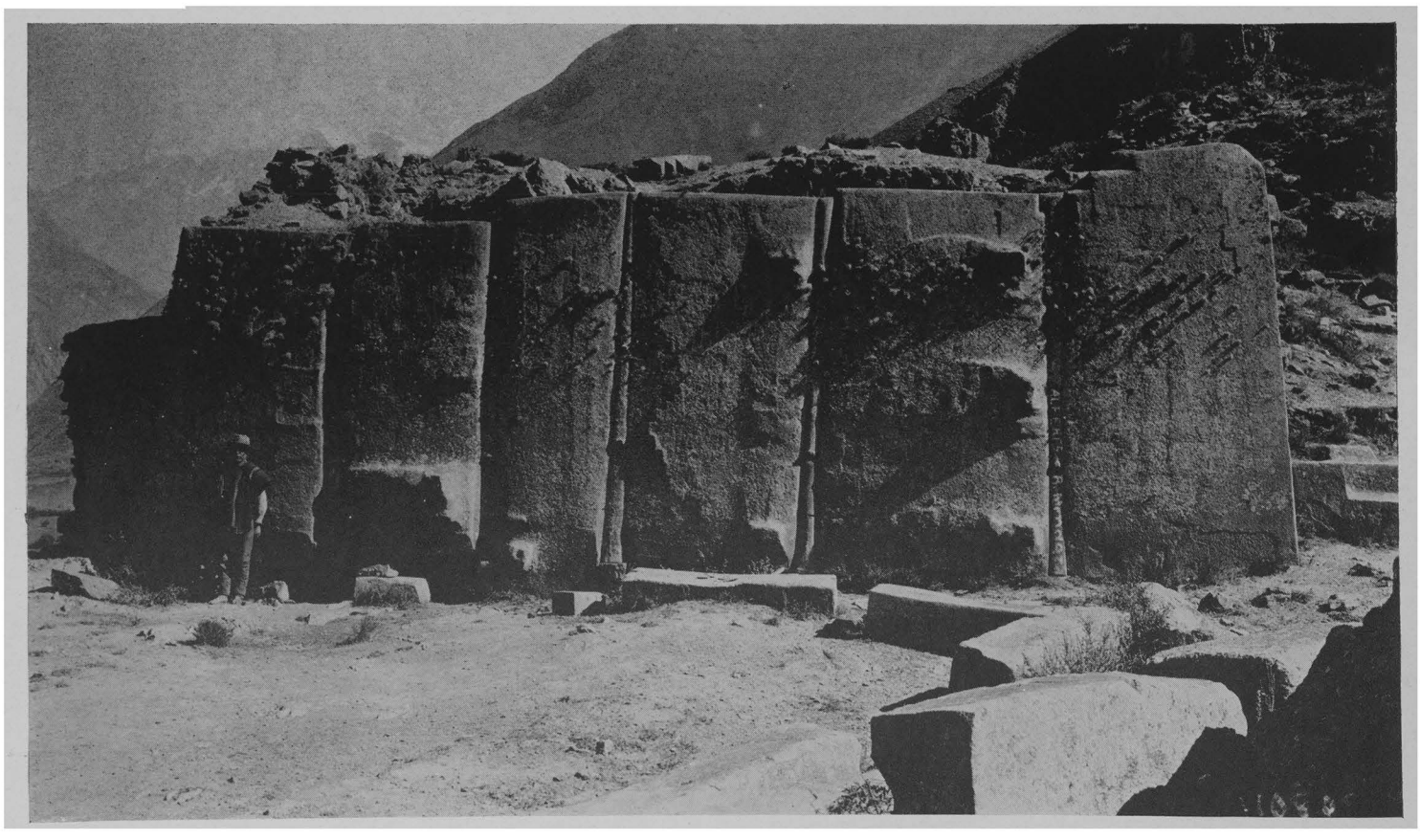


PLATE 18

(Left to right)

67. Sacsahuaman, Peru. Lower line of fortifications. 68. Macchu Picchu, Peru. East wall of principal Temple.
69. Macchu Picchu, Peru. Temple of the Three Windows. 70. Ollantaytambo, Peru. The Six Monoliths.

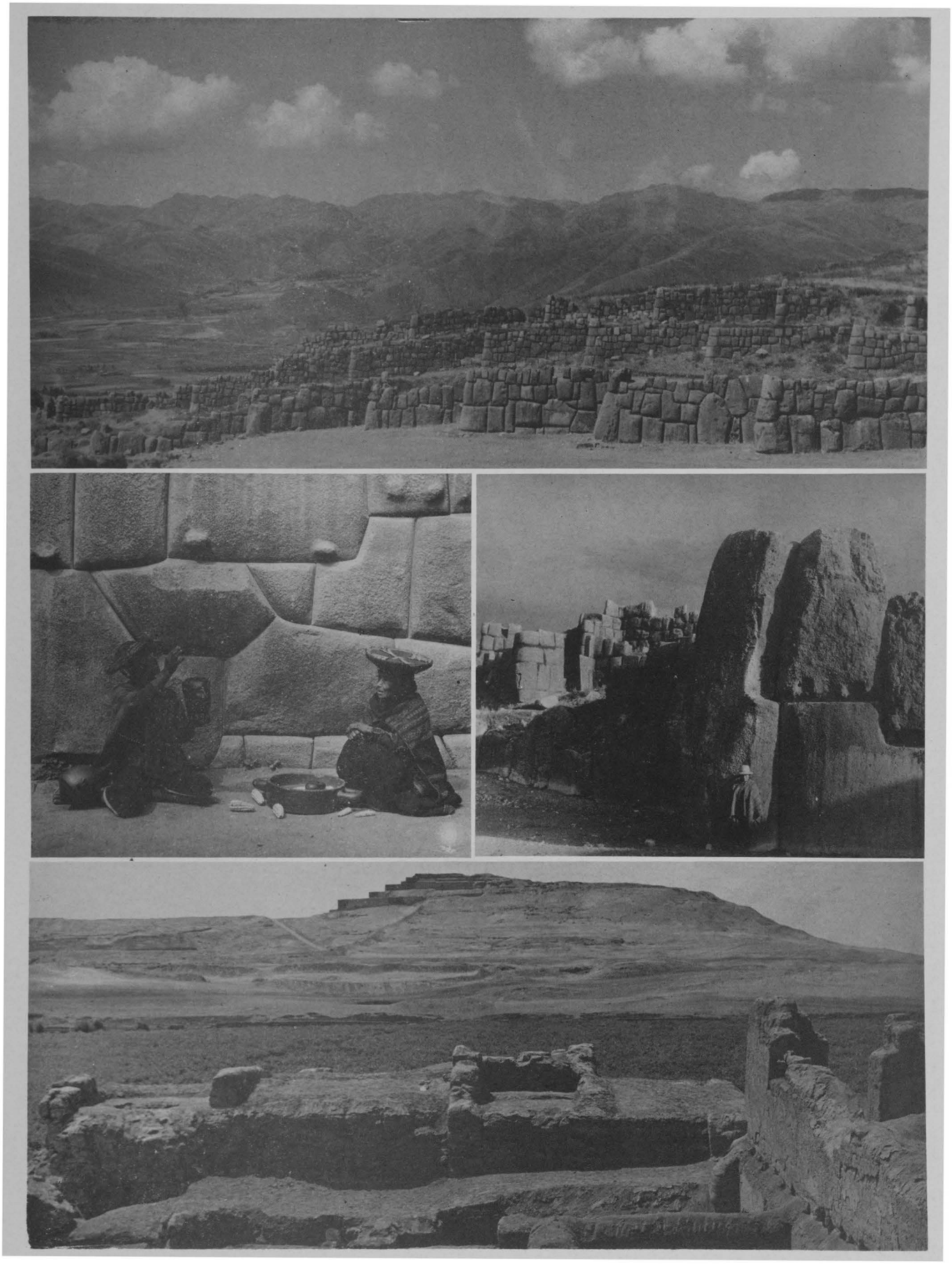
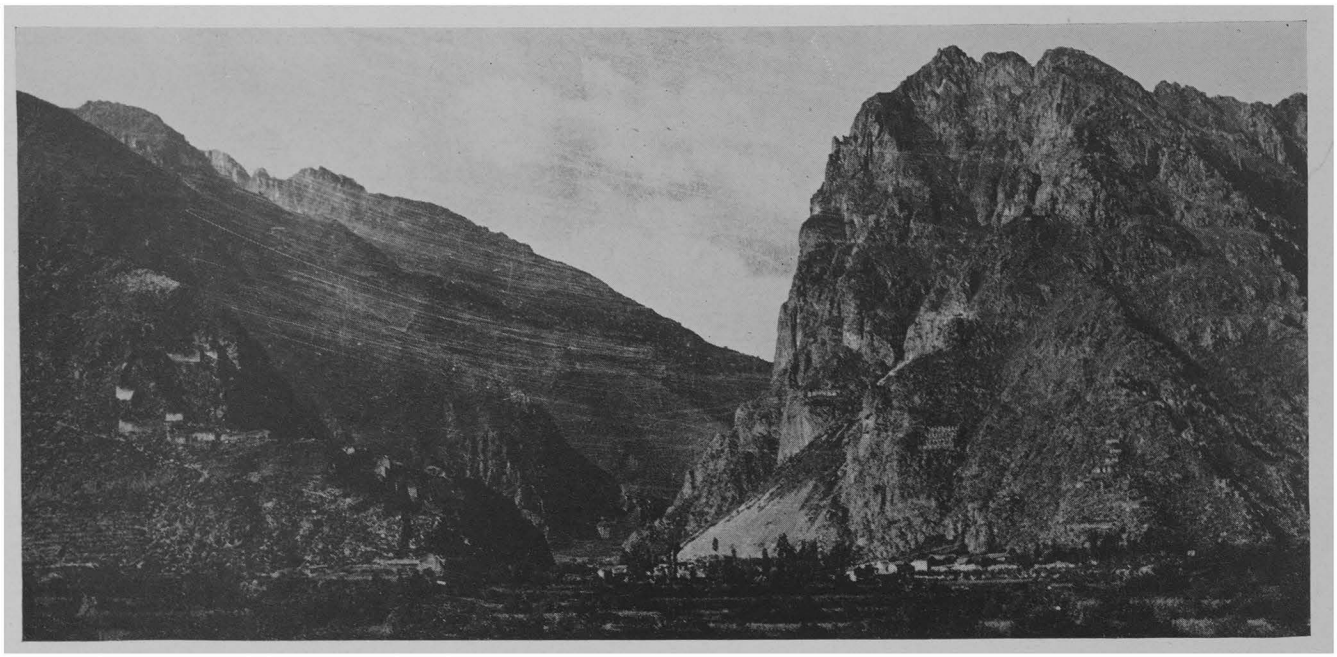


PLATE 19

(Left to right)

71–72. Sacsahuaman, Peru. 73. Cuzco, Peru. 74. Pachacamac, Peru.



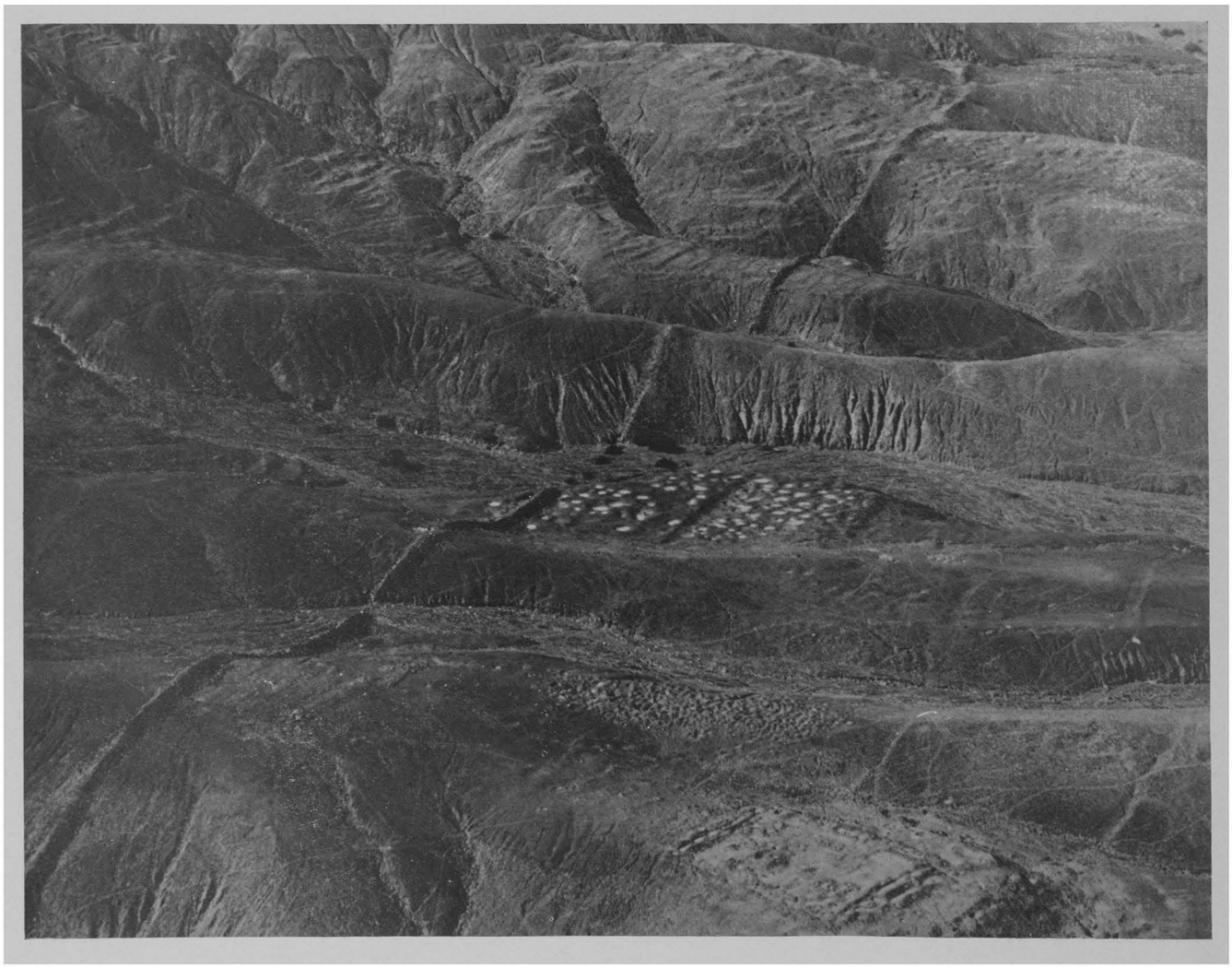


PLATE 20

75. Ollantaytambo, Peru. Fortress opposite the "Schools." 76. The Great Wall of Peru.

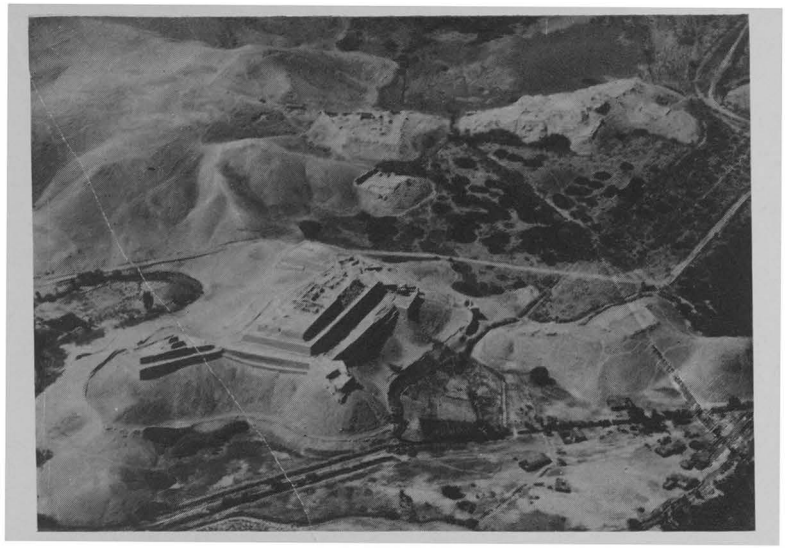


PLATE 21

(Left to right)

77. La Fortaleza. 78. Chan-Chan, Peru. 79. Cuzco, Peru. The Bowls. 80. Pisco Valley, Peru. "The Mysterious Pock Marks." 81. Pisco Valley, Peru. Ancient irrigation system of the Chimu.

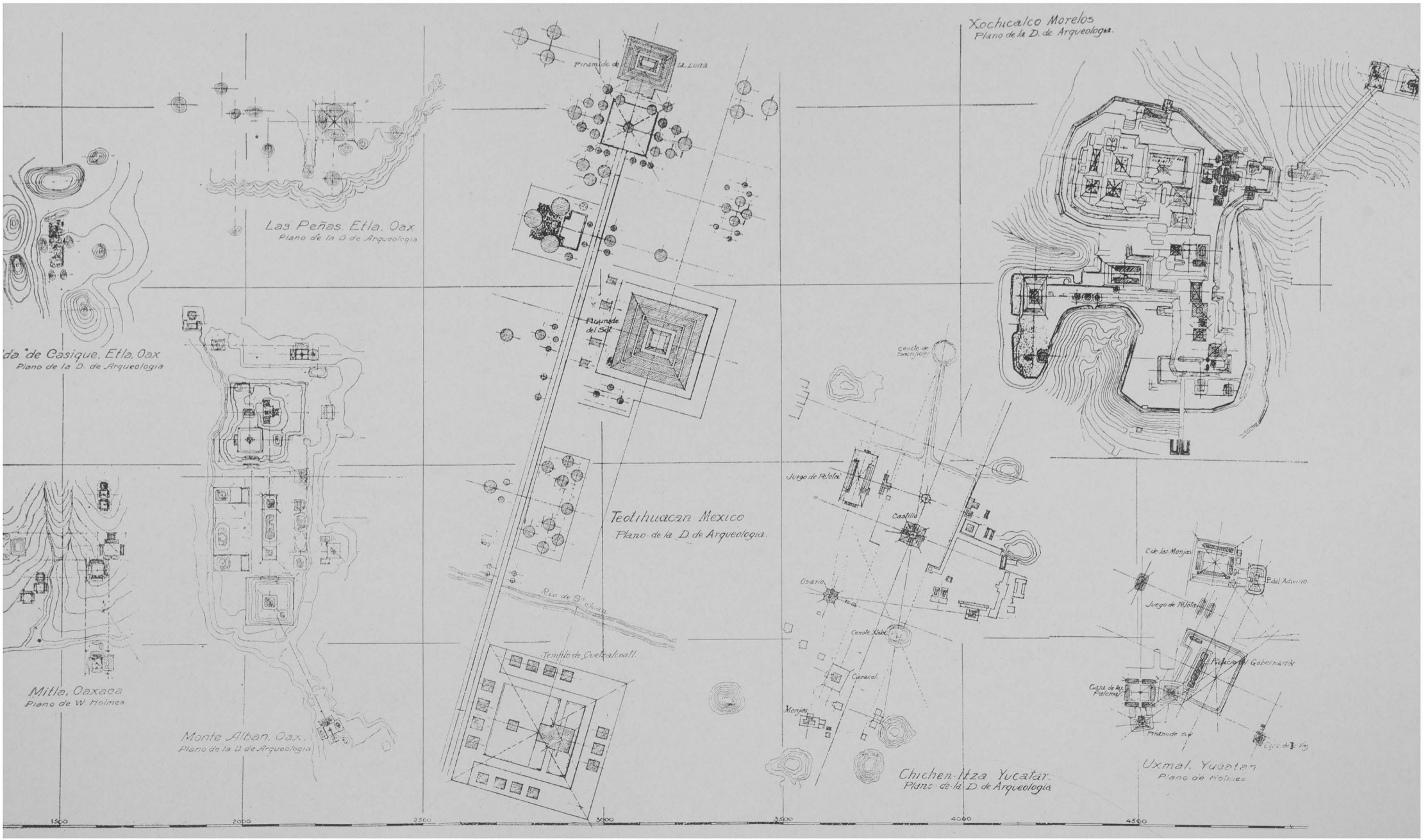


PLATE 22

82. Part I. Comparative study of the principal archeological sites of Mexico.

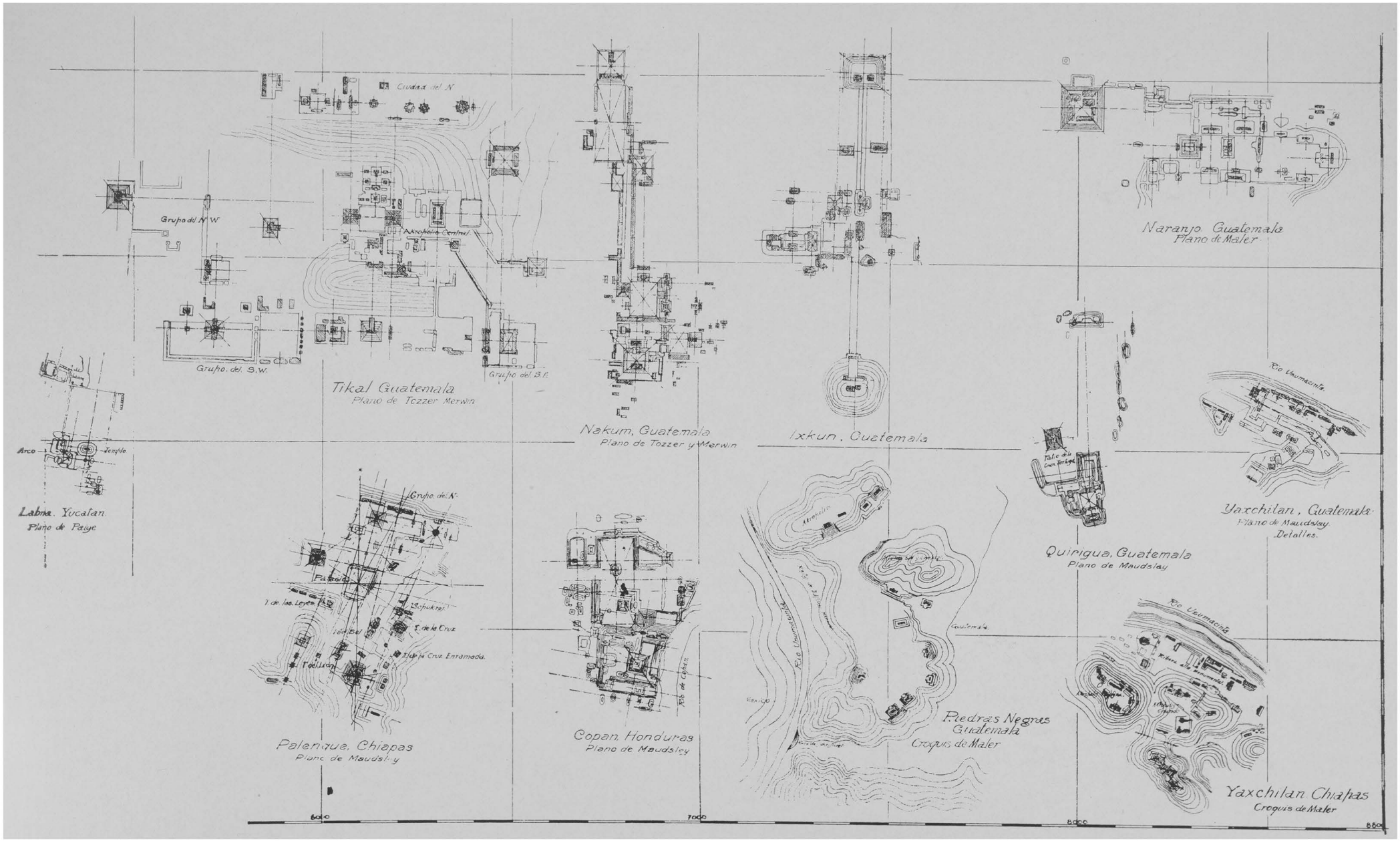


PLATE 23

83. Part II. Comparative study of the principal archaeological sites of Mexico.

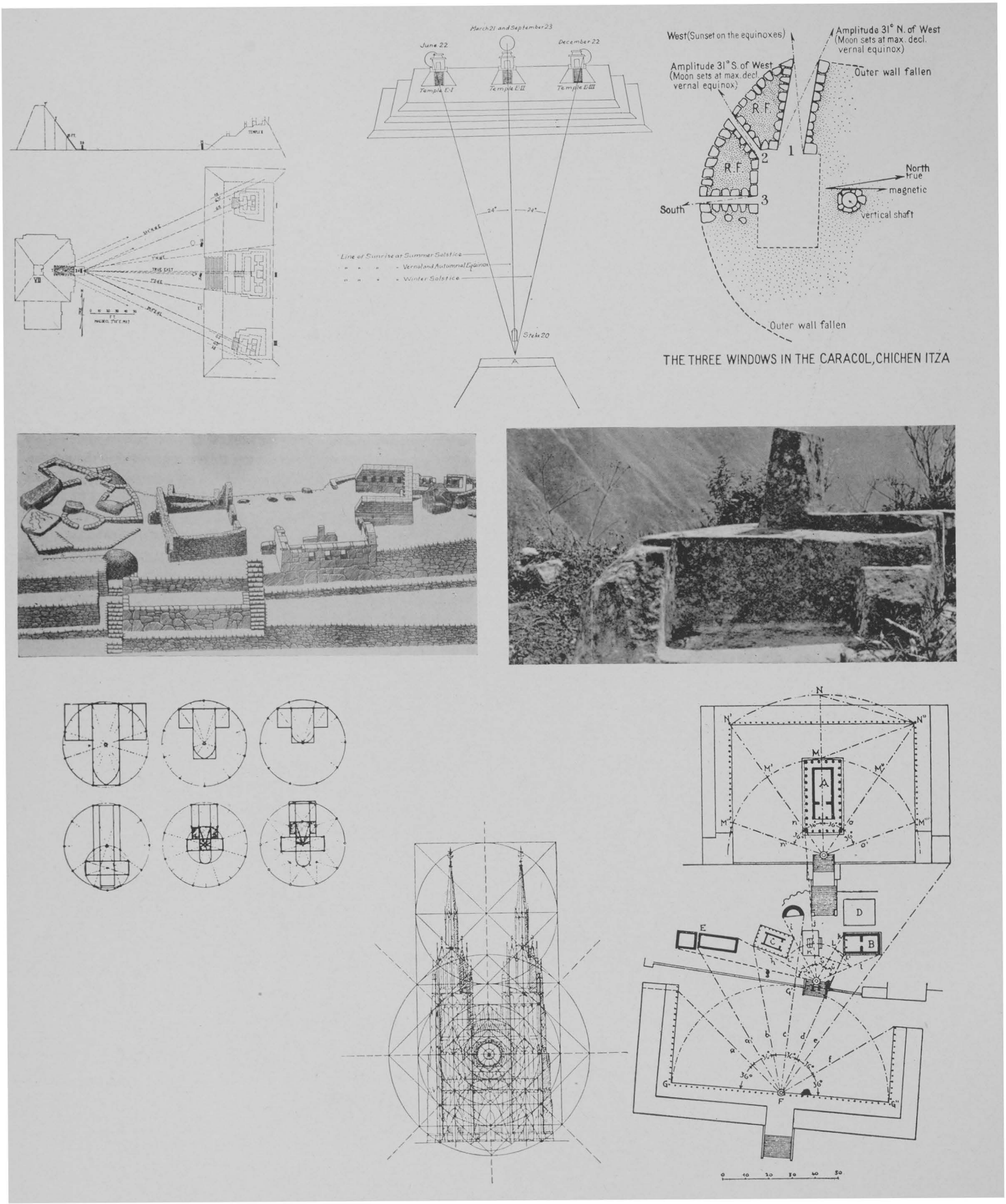
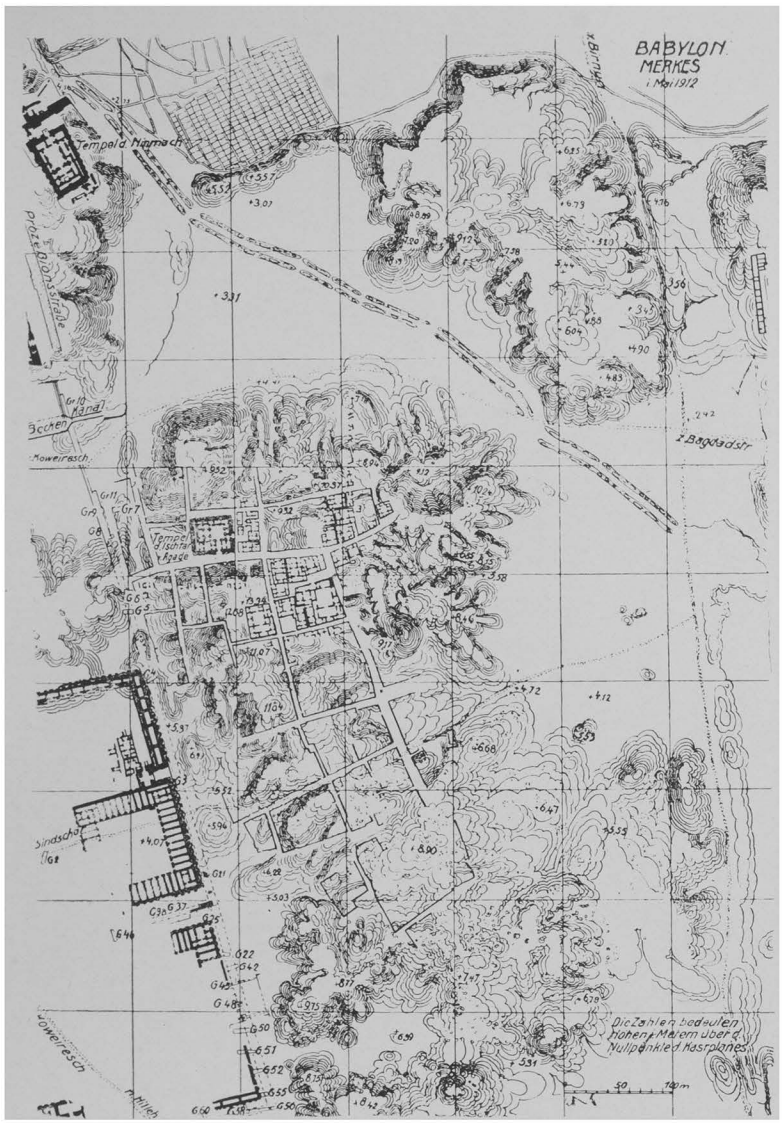
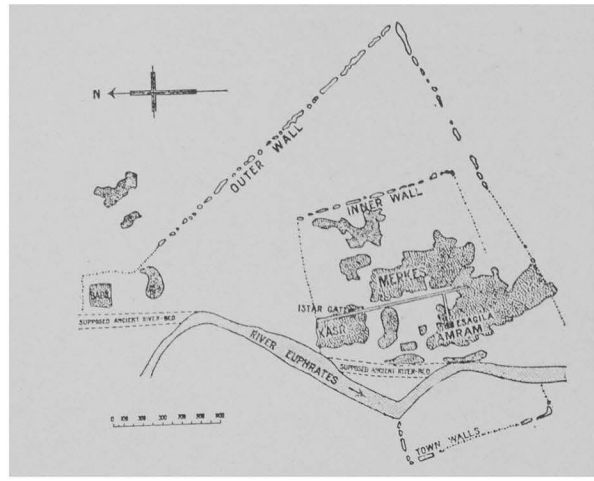


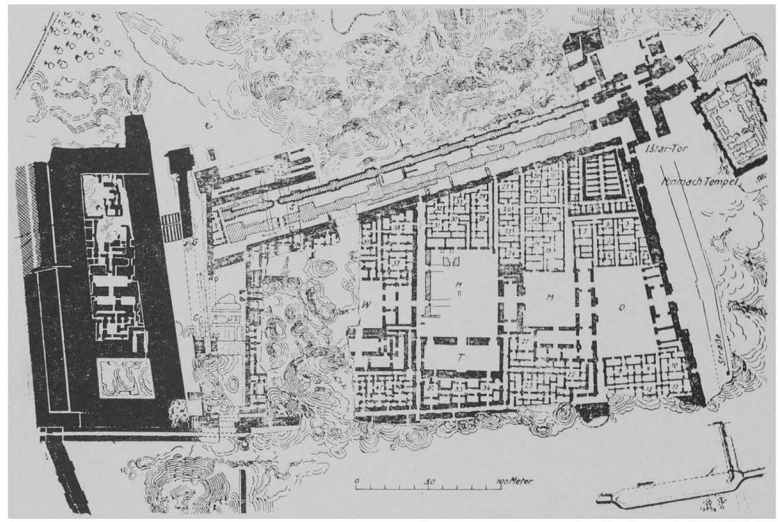
PLATE 24

(Left to right)

The Uaxactun Astronomical Observatory: 84. Ground plan of Temples E-I, E-II, and E-VII. Above, a cross-section along an east-west line. 85. Diagram showing the arrangement at Temples E-I, E-II, E-III, Pyramid E-VIII, and Stela 20. 86. Diagram of the Three Windows in the Caracol, Chichen Itza. 87. Bird's-eye-view of Sacred Plaza and Snake Rock. 88. The Intihuatana Stone. 89. Diagram of proportions in plan and section. 90. Ancient drawing of the cathedral of Strassburg. 91. Asklepieion in Kos.







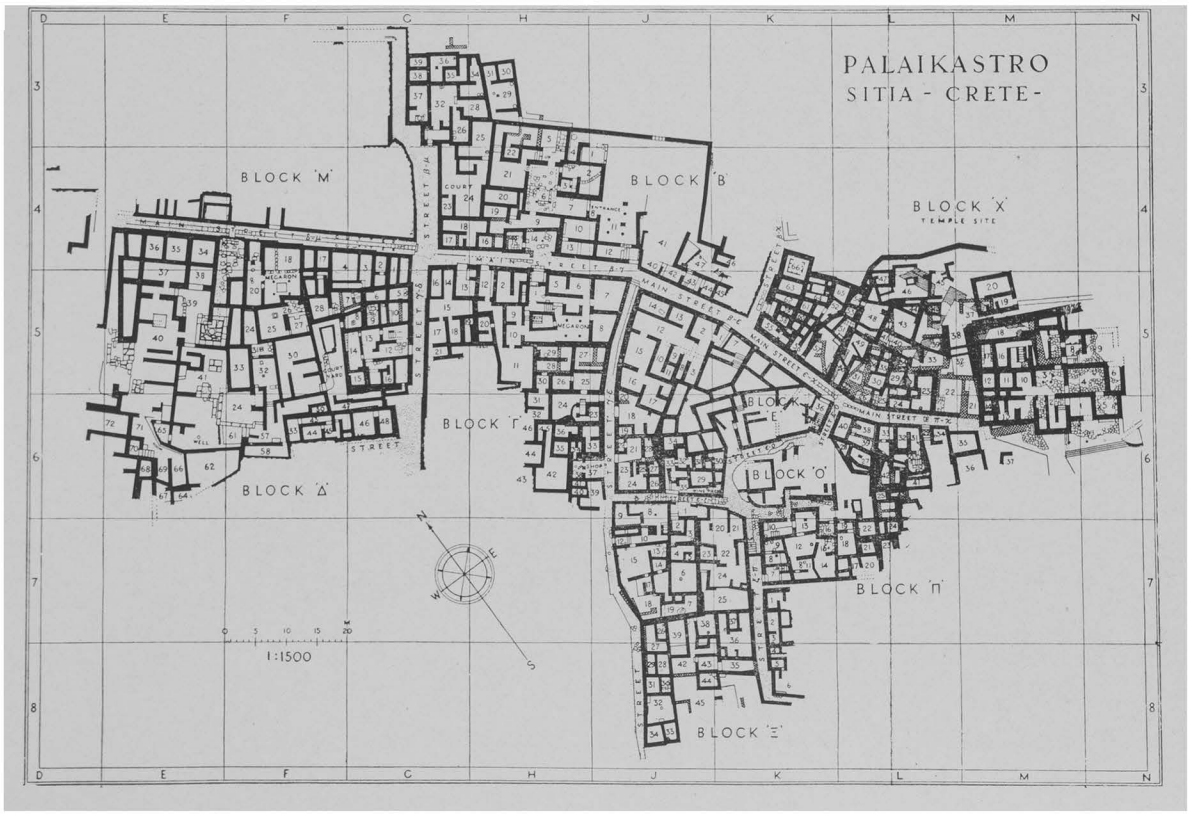
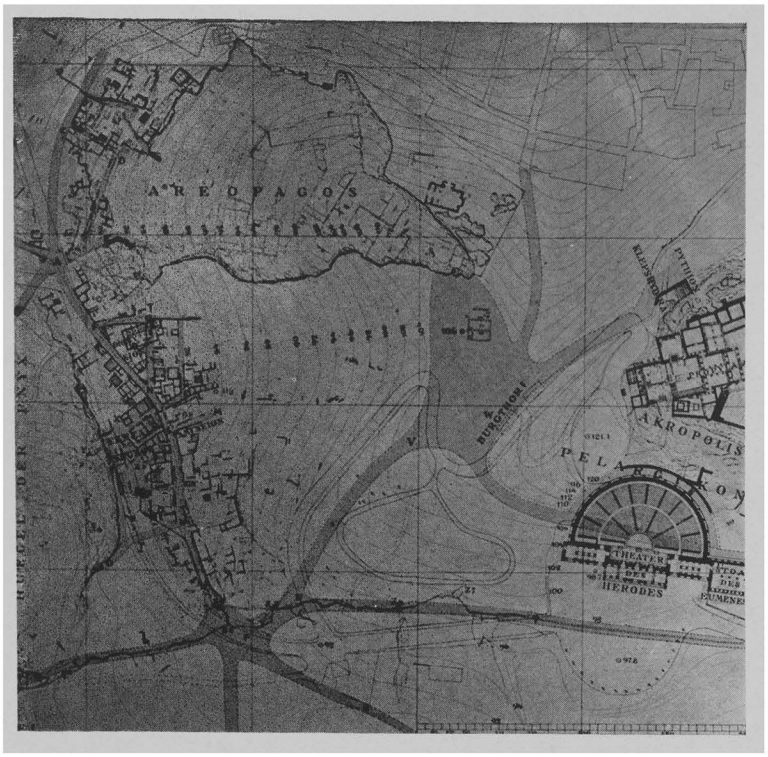
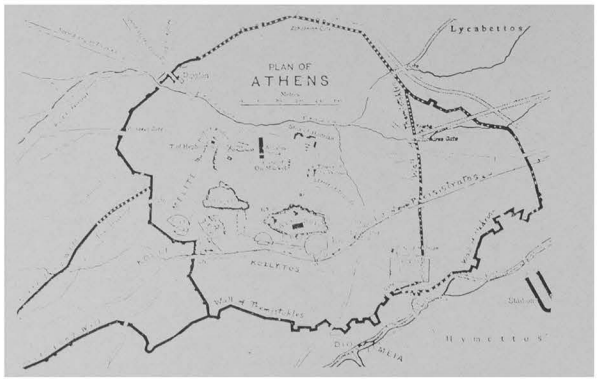


PLATE 25

(Left to right)

Babylon: 92. General map. 93. Plan of the Merkes Quarter. 94. Plan of the Fortress of Kasr. 95. Palaikastro, Crete.





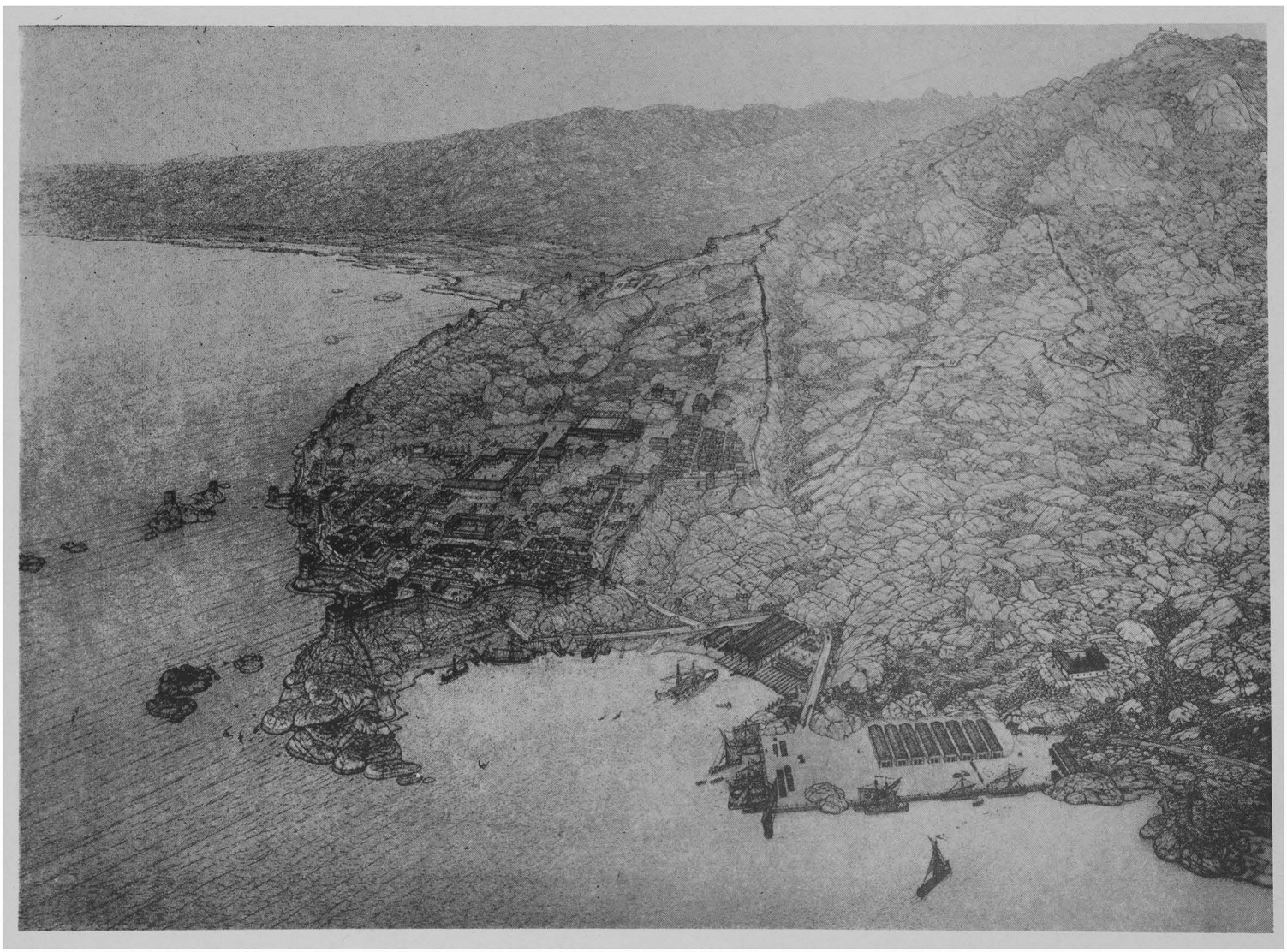


PLATE 26

(Left to right)

96. Athens. Excavated surroundings of "the main ancient road," leading to the Acropolis. 97. Plan of Ancient Athens. 98. Piraeus, Harbor of Athens, aerial view of hippodamic town. 99. Heracleia, Reconstruction.

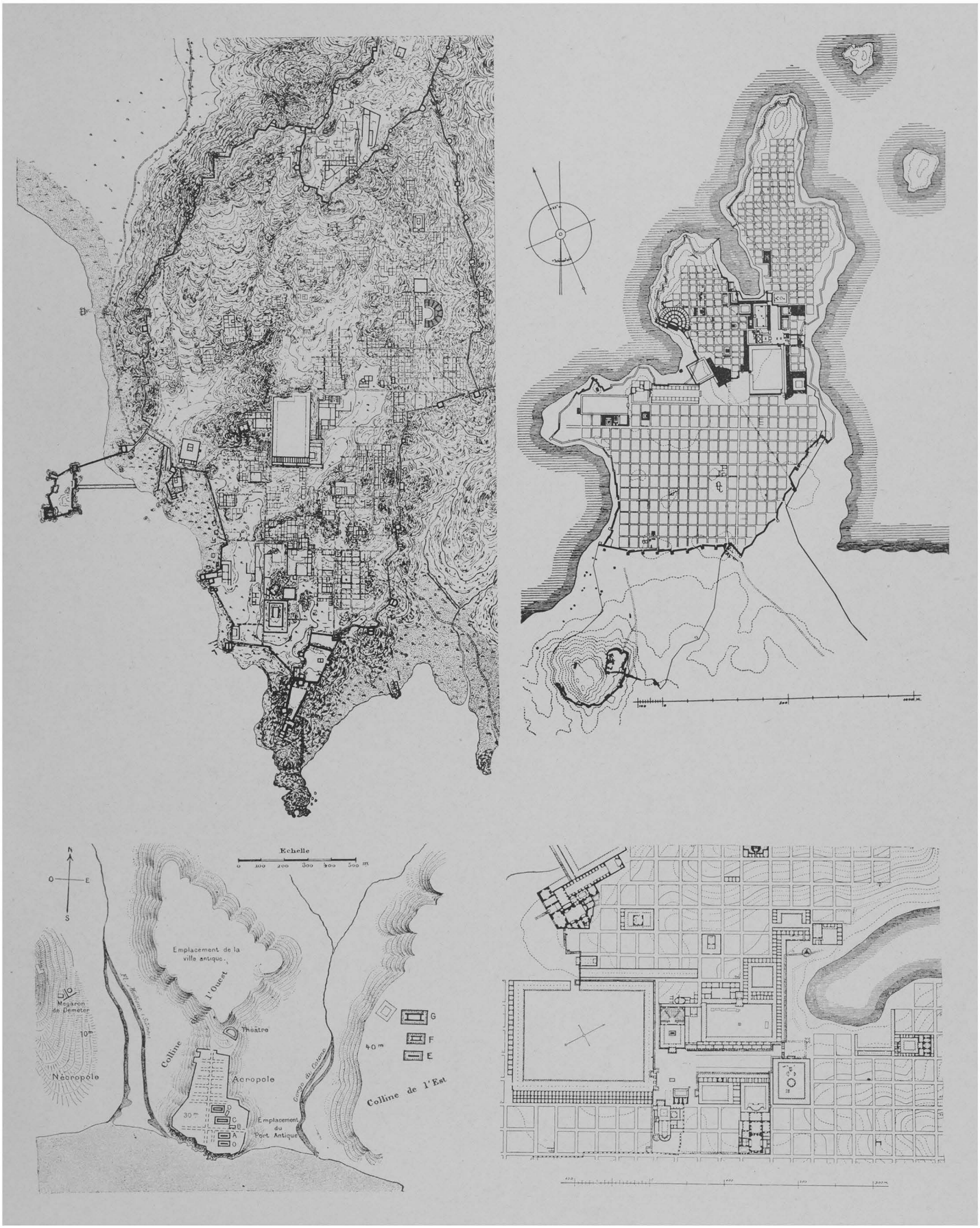


PLATE 27

(Left to right)

100. Heracleia. General plan. 101. Milet. The regular gridiron pattern. 102. Milet. Civic center. 103. Selinunt.

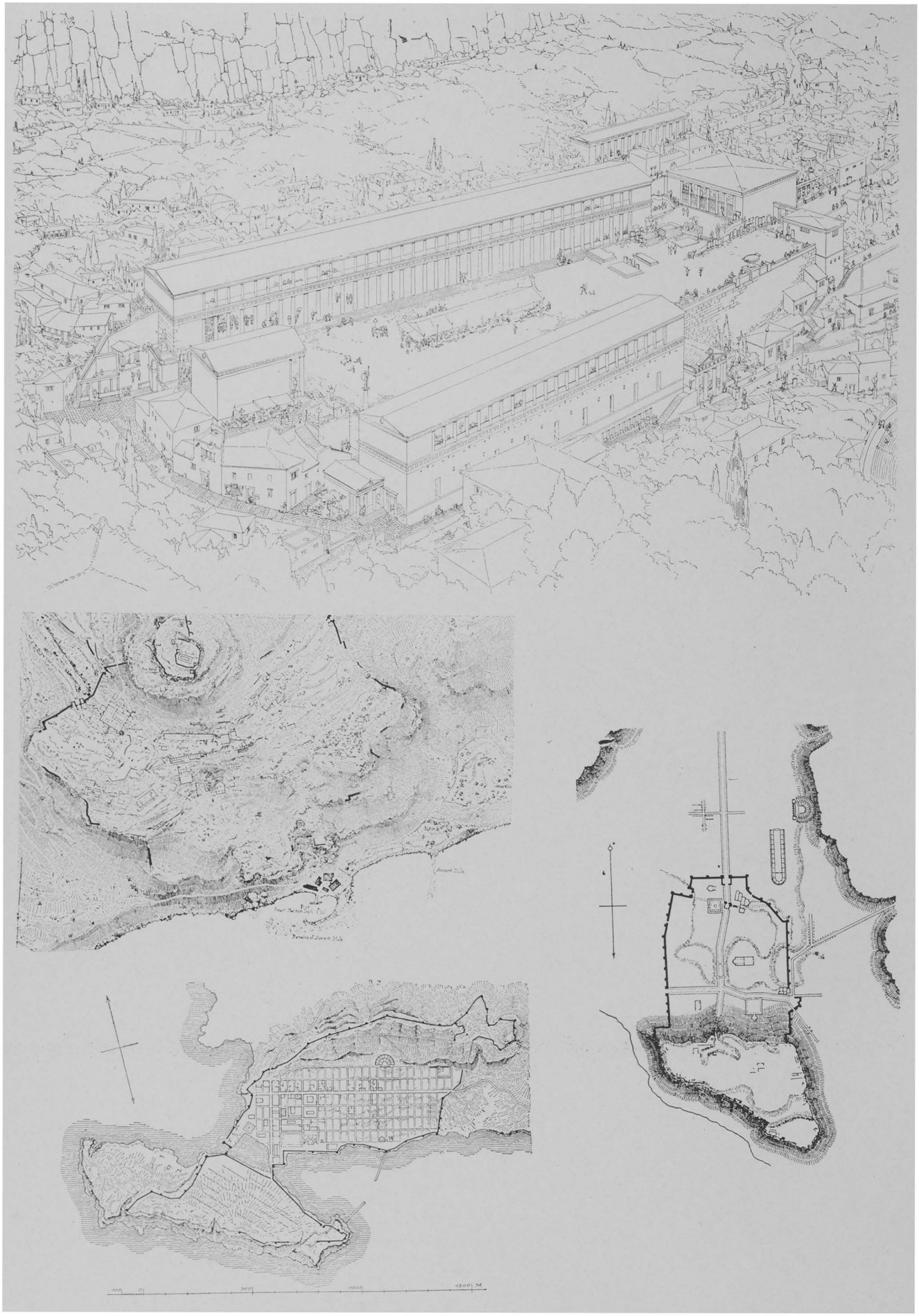
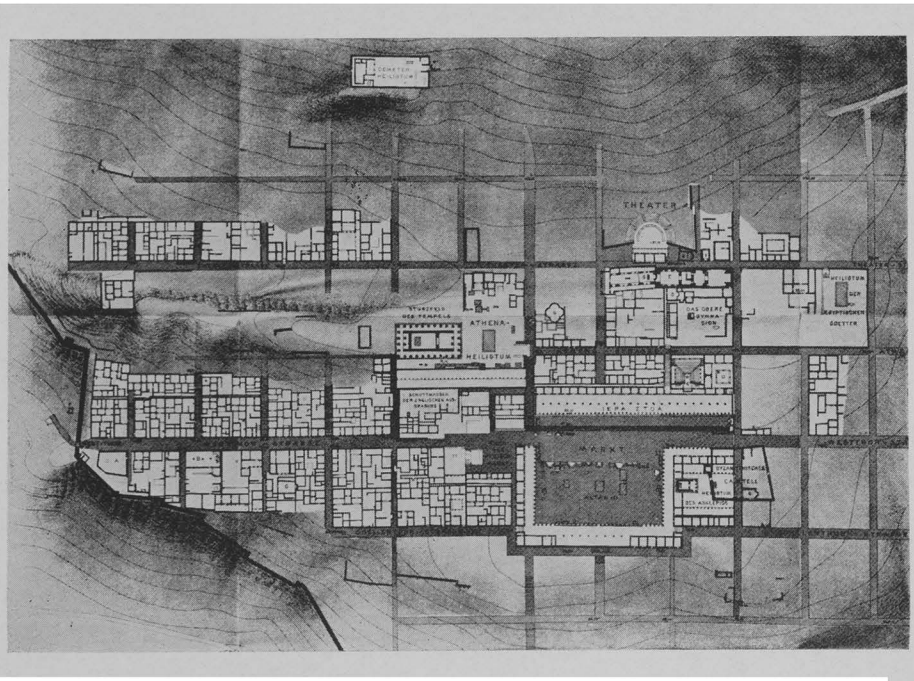
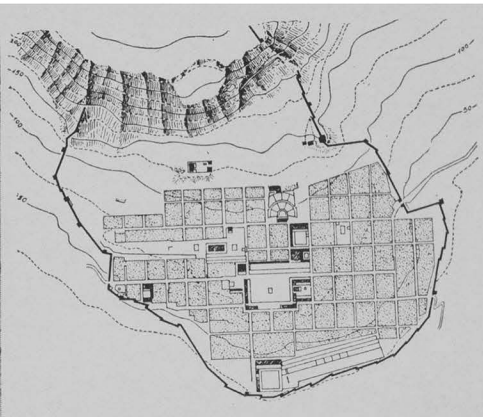


PLATE 28

(Left to right)

104. Assos. Restoration of Agora. 105. Plan of Assos. 106. Cnidus. 107. Perge. Procession streets lined with columns.





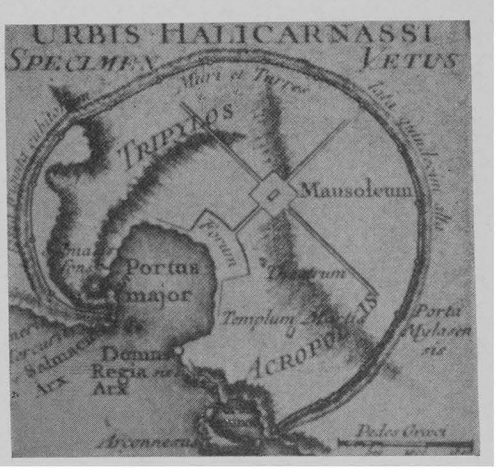
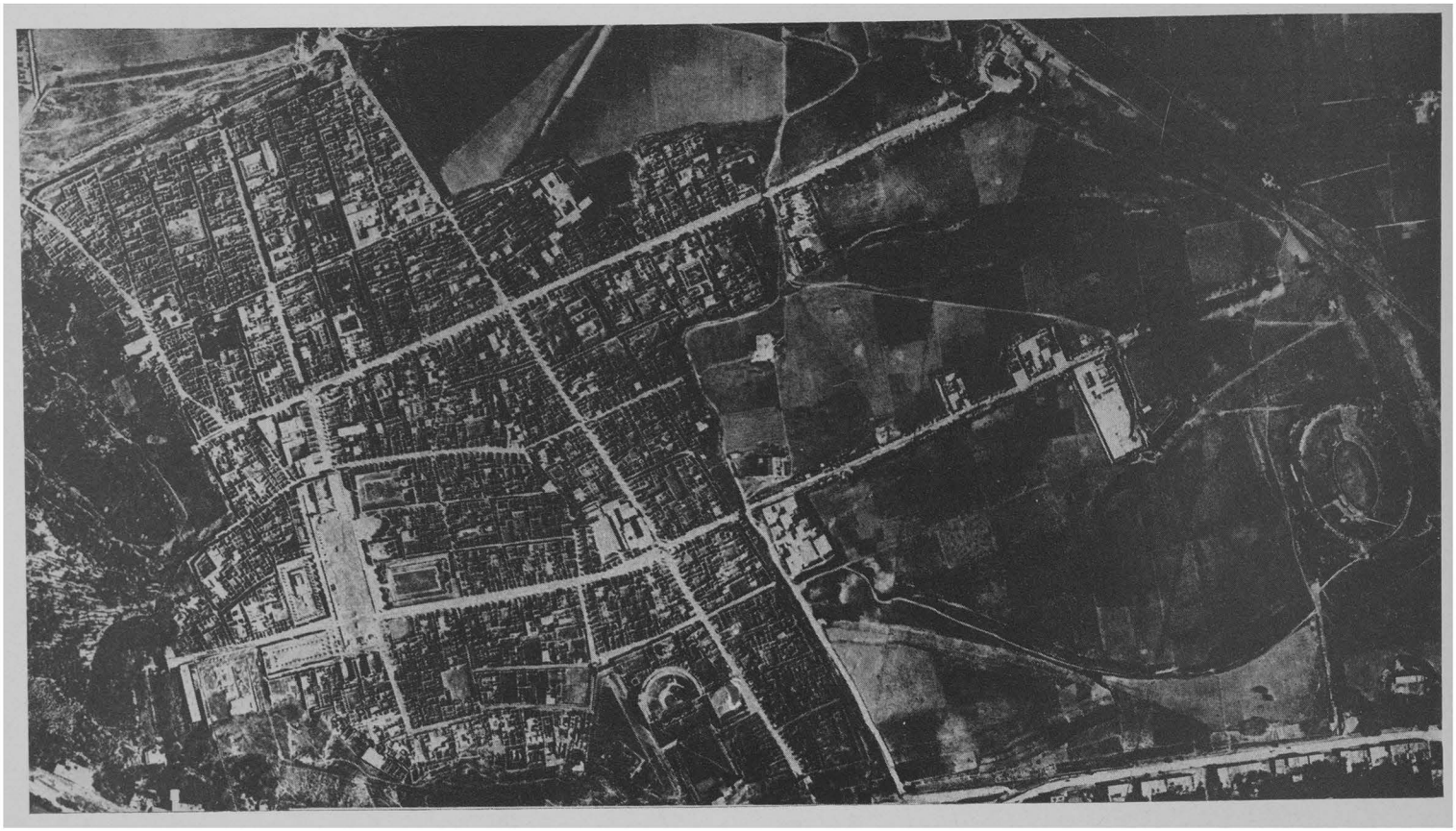
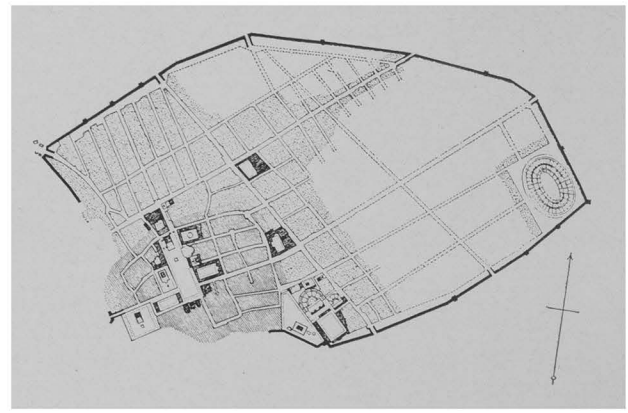


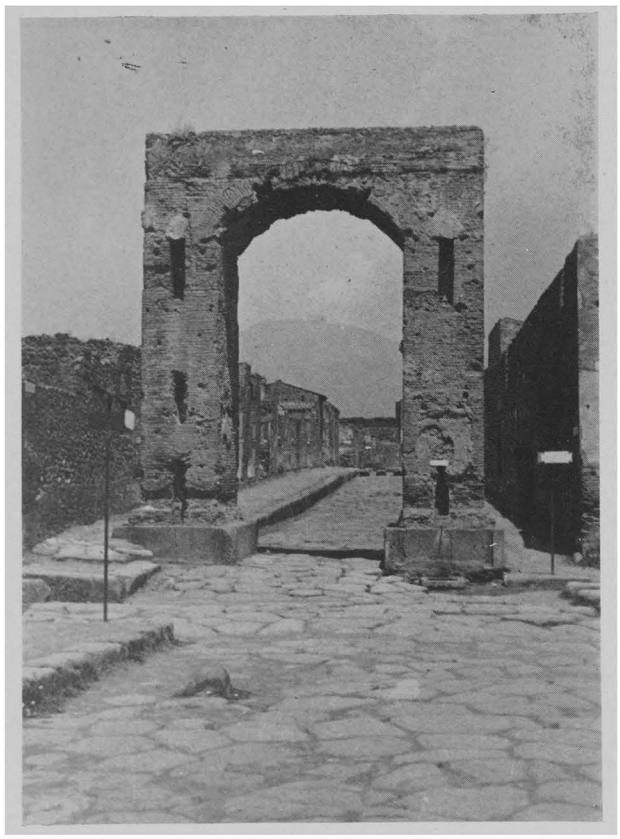
PLATE 29

(Left to right)

108. Priene. Panorama. 109. Priene. Part of the plan.
110. Priene. Total plan. 111. Halicarnassus.







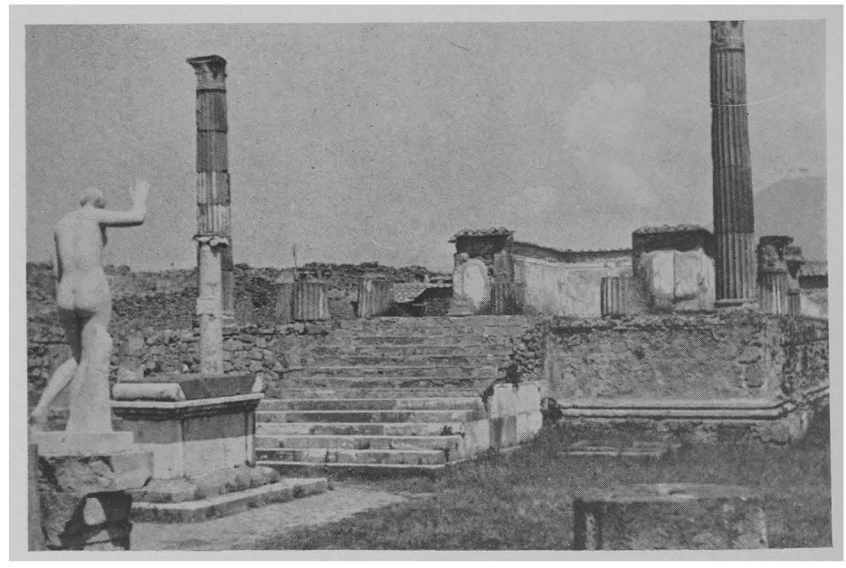


PLATE 30

(Left to right)

Pompeii: 112. Airview of excavations. 113. General layout. 114. One of the principal gates. 115. The Temple of Apollo.

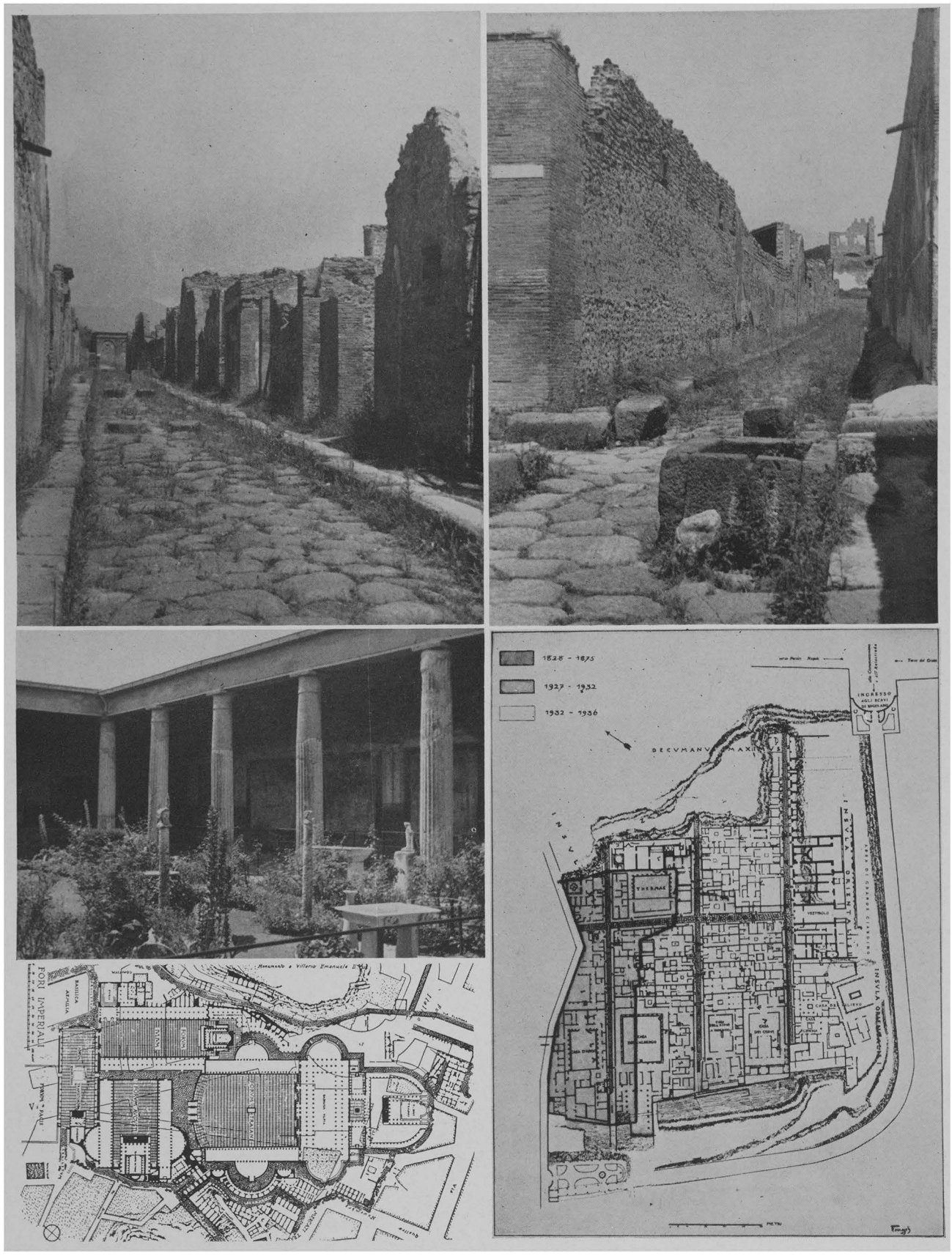
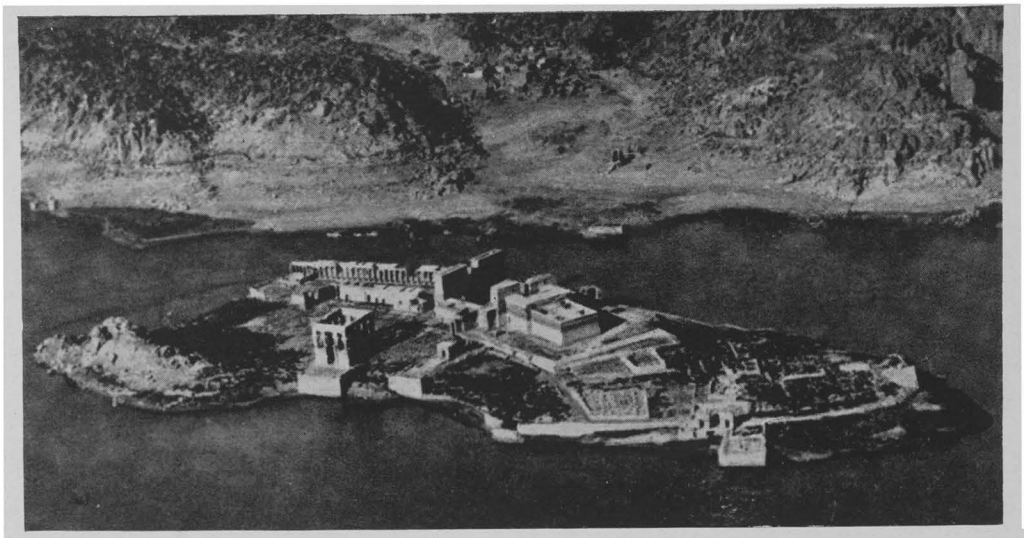
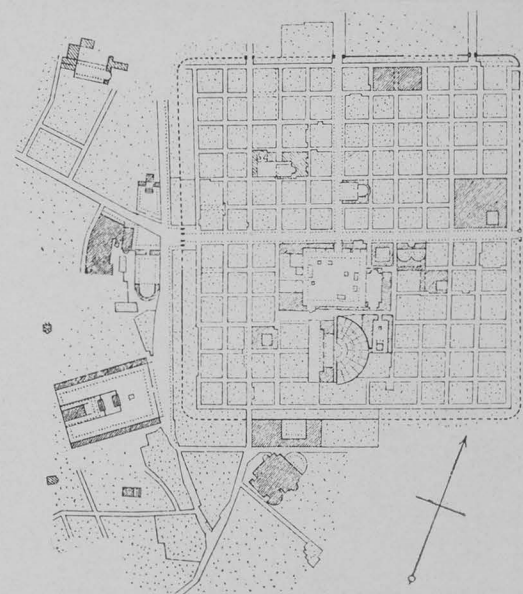


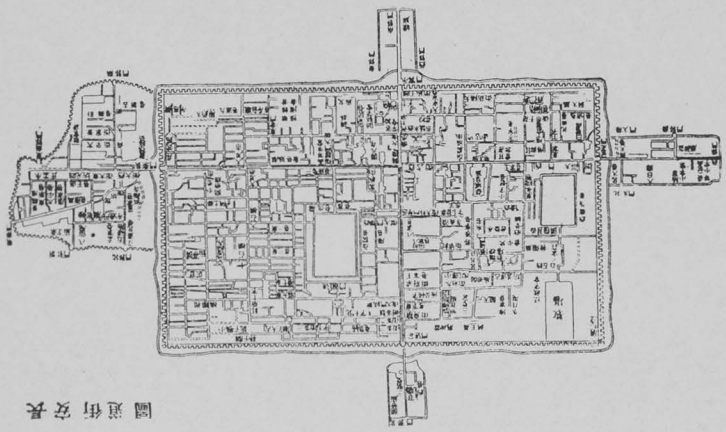
PLATE 31

(Left to right)

116. Street in Pompeii. 117. Street in Pompeii. 118. Patio in one of the Pompeian houses. 119. Plan of Herculaneum. 120. Rome. The Imperial Fora.







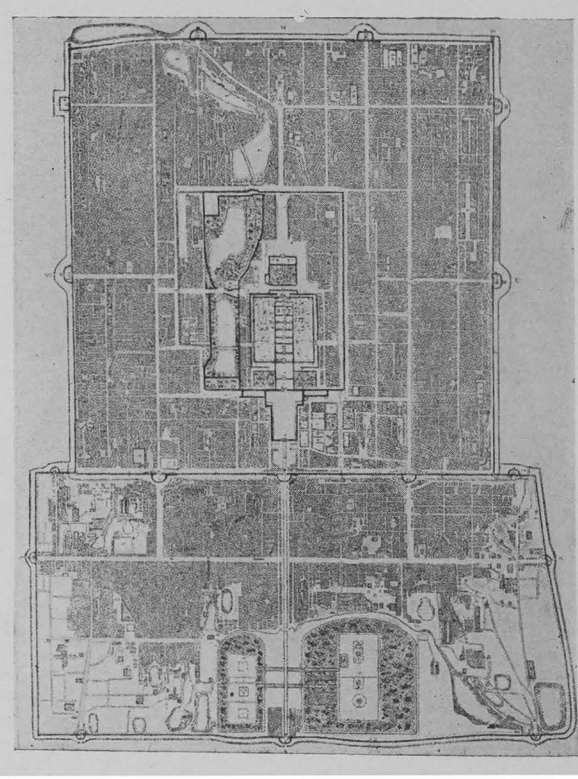
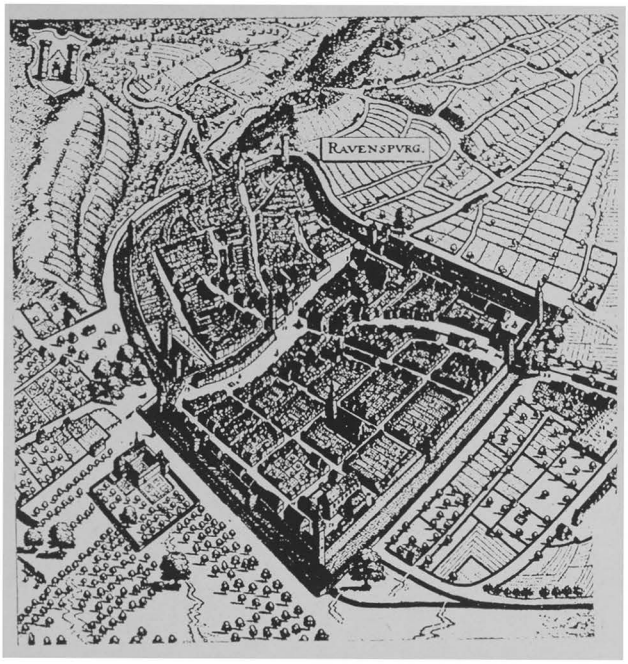
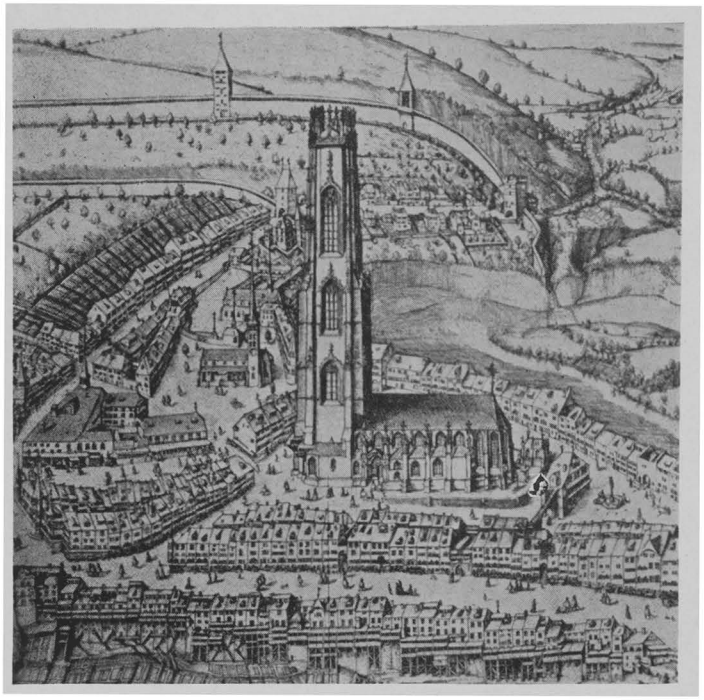


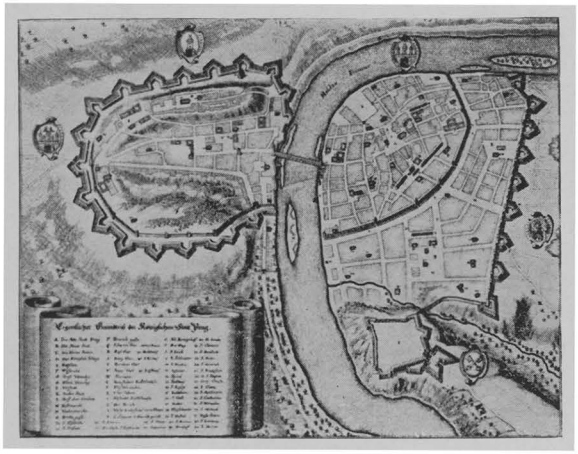
PLATE 32

(Left to right)

121. Philae. The Temple Island in the Nile. 122. Timgad. 123. Tsinanfu, China, capital of Shantung Province. 124. Sianfu, China, capital of Shensi Province. 125. Peking, China.







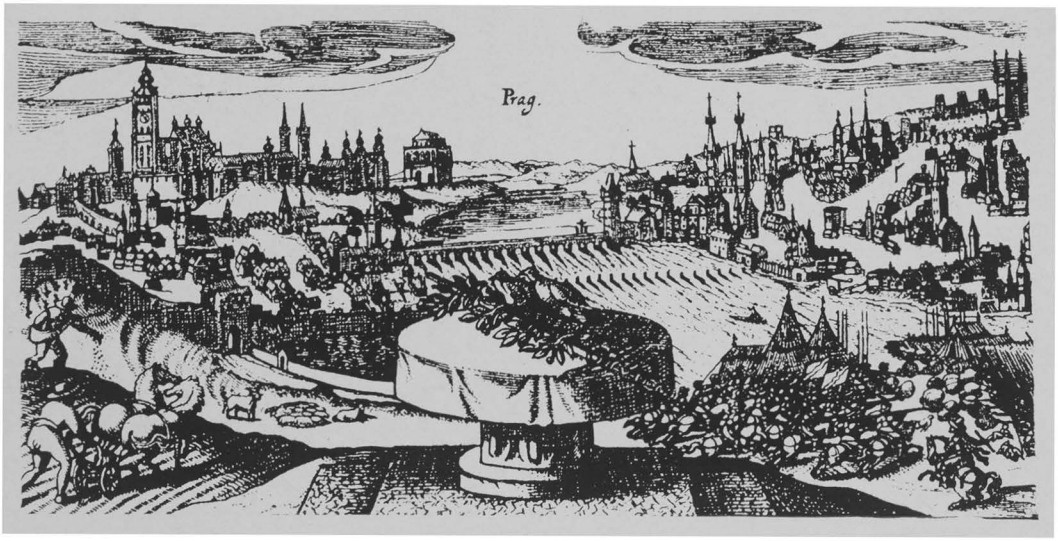
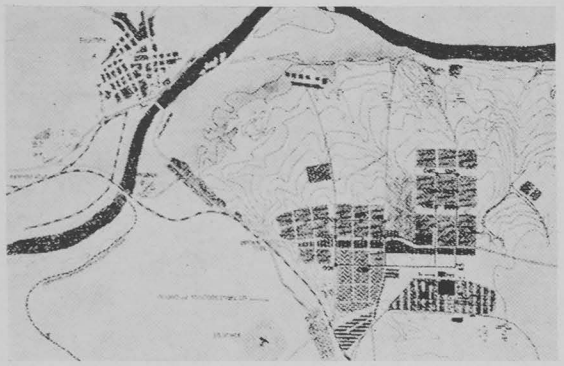
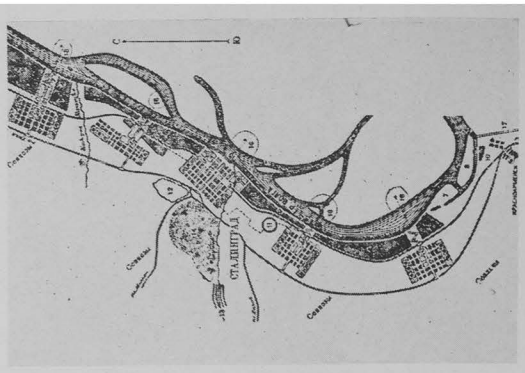


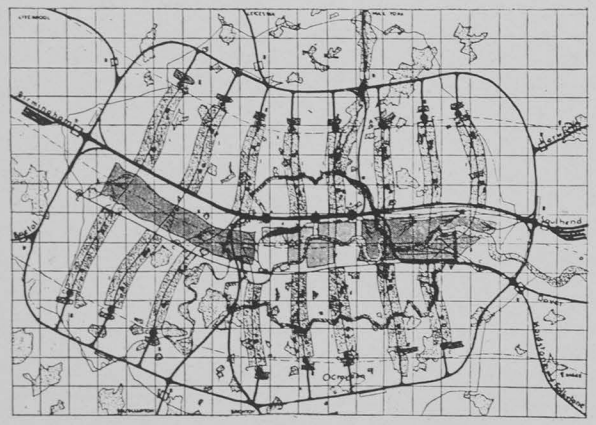
PLATE 33

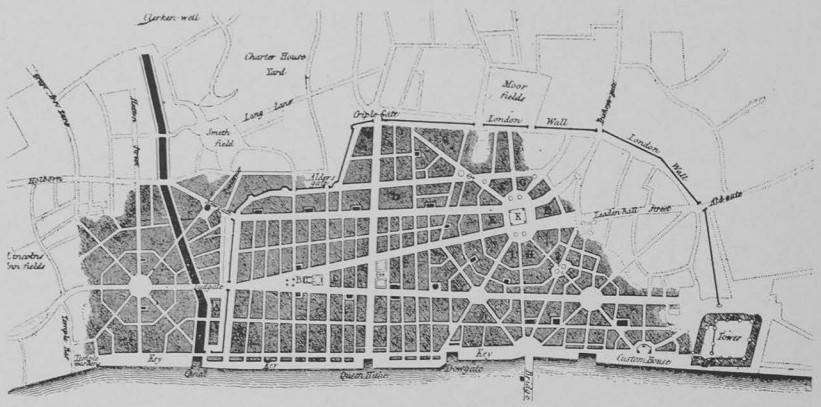
(Left to right)

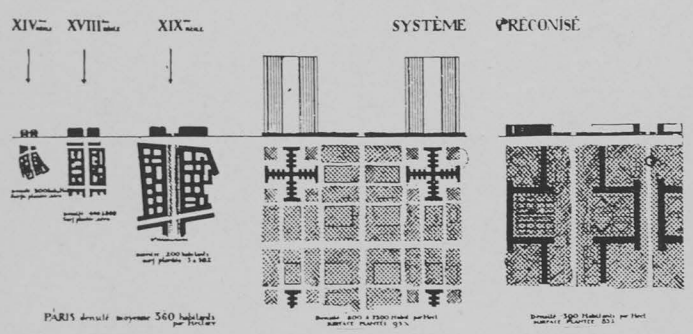
126. Davensburg, after Merian, Topographia Sueviae. 127. Freiburg, Switzerland. Section from Martini's plan, 1606. 128. Prague (17th century). 129. Breslau. The capital city of Silesia. Aerial view of the medieval city. 130. Prague. Woodcut from Thesaurus Philopoliticus by Daniel Meissner, Frankfurt, 1629 (?).











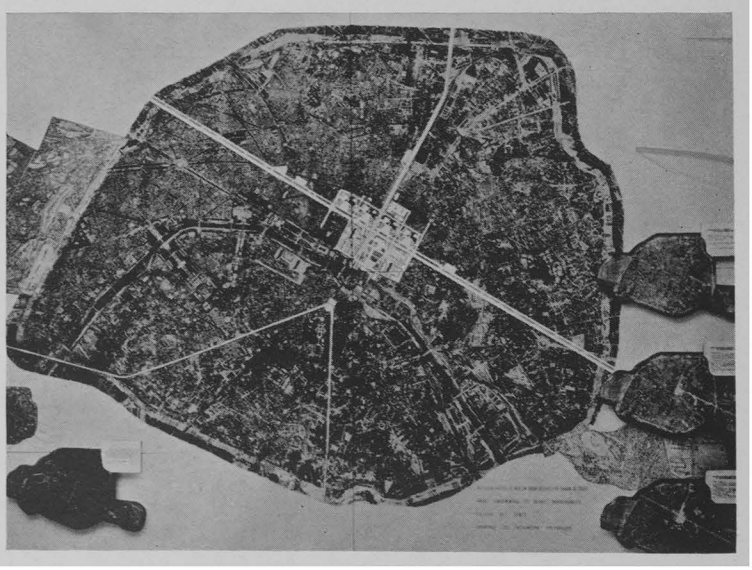


PLATE 34

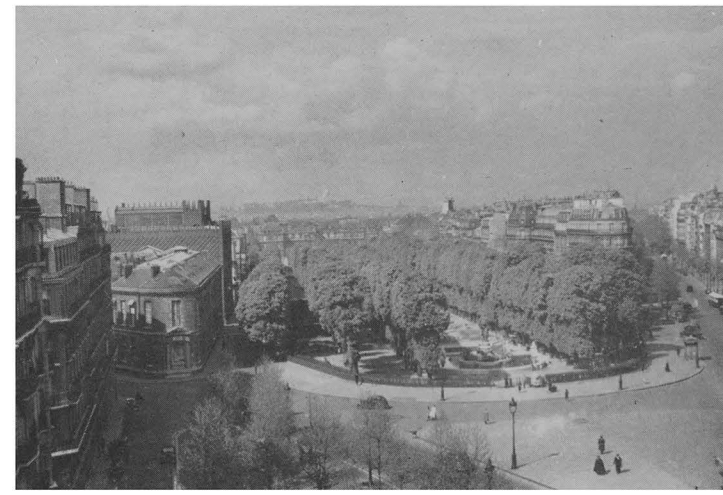
(Left to right)

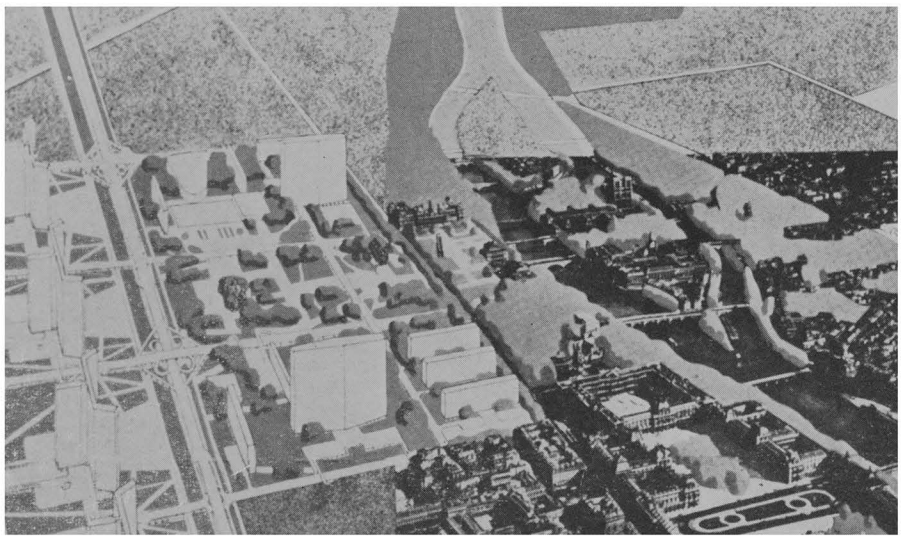
131. Kaschira, Russia. 132. Magnitogorsk, Russia. 133. Stalingrad, Russia. First sketch for extension of city. 134. London, the reconstruction plan by the M.A.R.S. (Modern Architectural Research) Group. 135. London, the famous Wren Plan. 136. Paris panorama in the 17th century. 137. Comparative study of city block dimensions and layouts from the 14th to the 20th century by Le Corbusier. 138. Paris. The famous Haussman "Operation." 139. Paris, plan of 1937 by Le Corbusier.

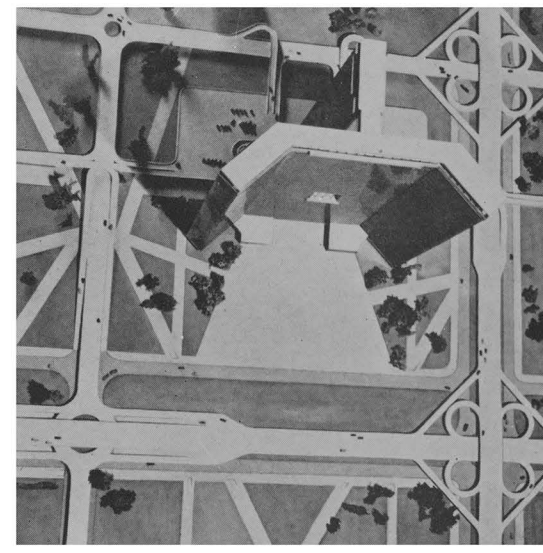
PLATE 35

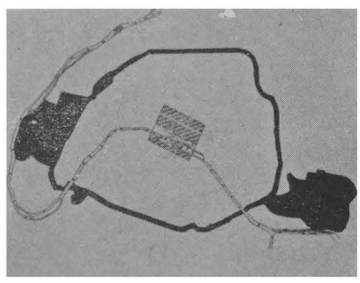
(Left to right)

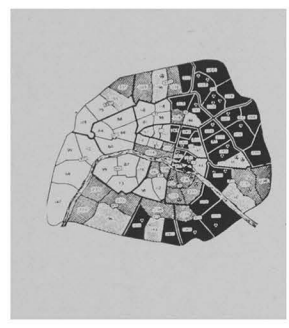
140. Paris, view from Montparnass. 141–146. Paris, "La Ville-Radieuse," by Le Corbusier. 147. Buenos Aires, directive plan of 1938 by Le Corbusier in collaboration with Ferrari and Kurchan. 148. Project "E," 1939, by Le Corbusier.

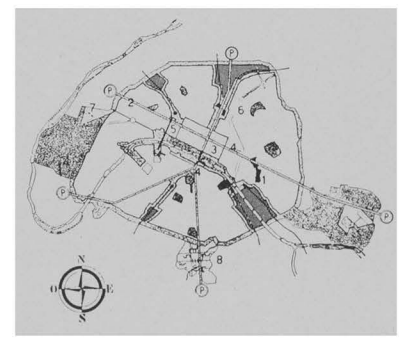


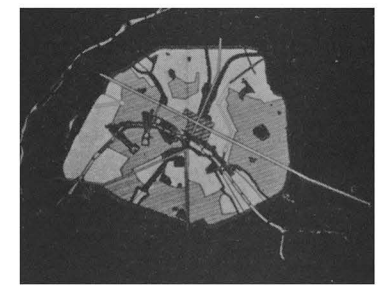


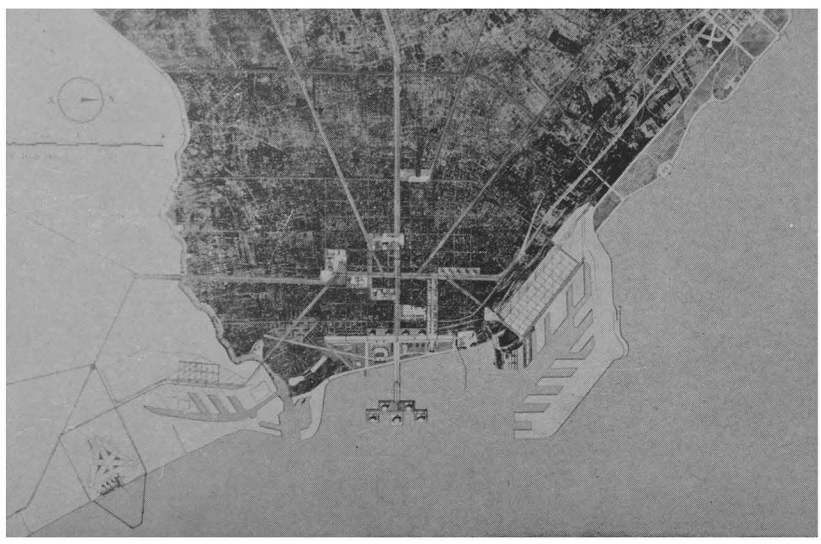


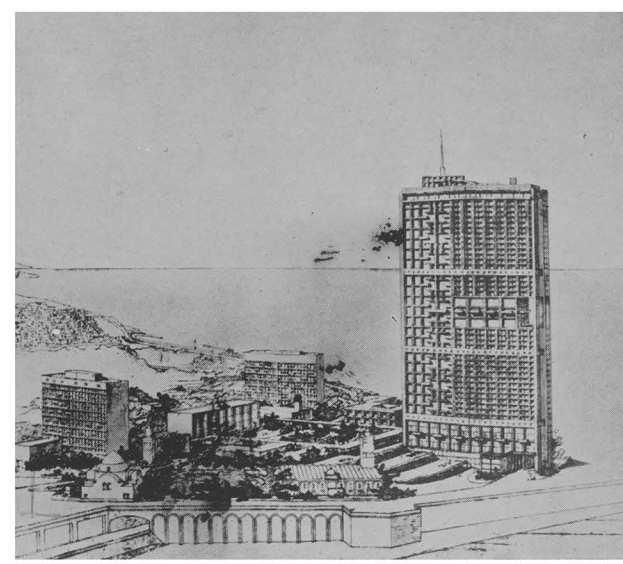












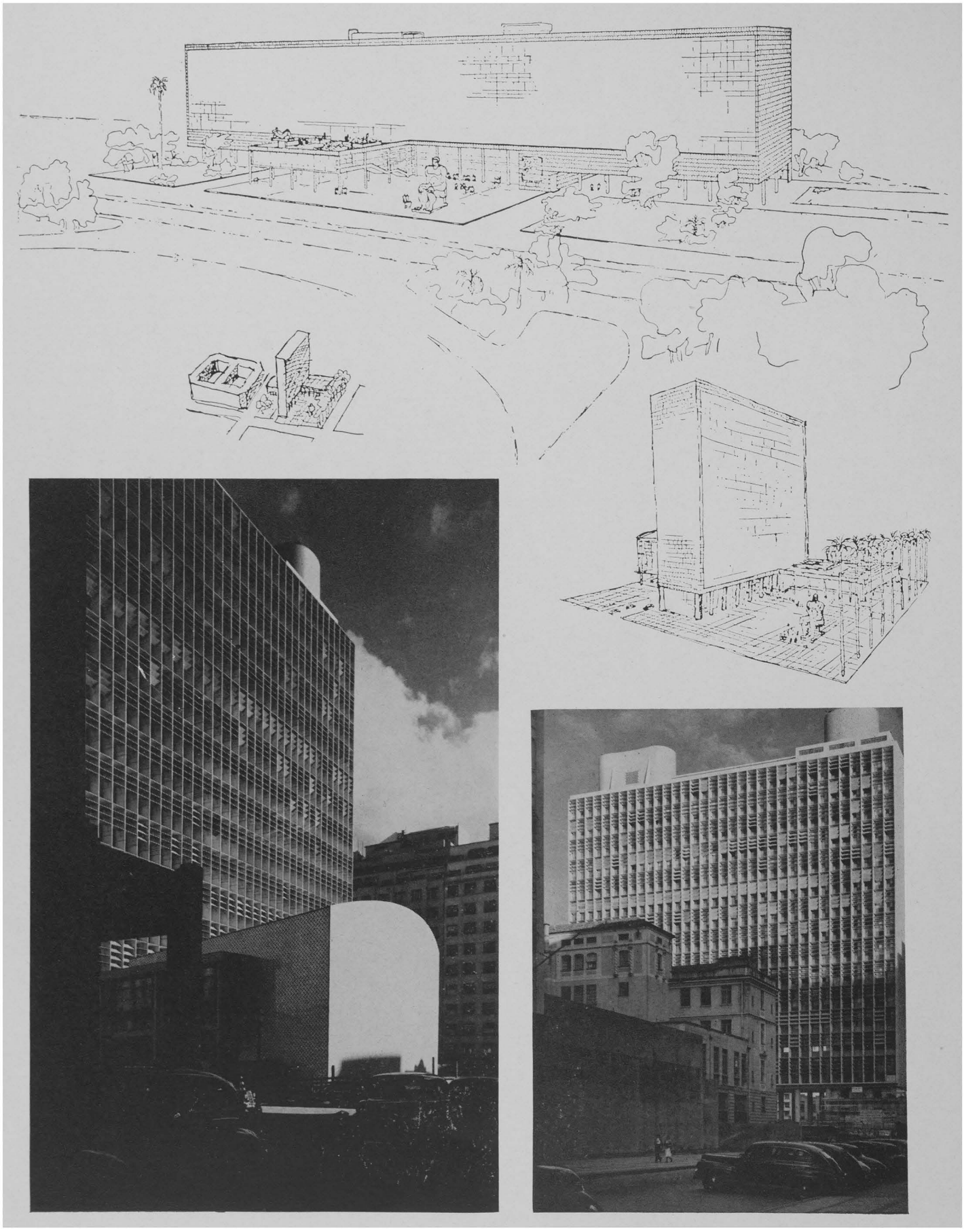


PLATE 36

(Left to right)

149. Rio de Janeiro, Ministry of Education and Health. 150–151. Sketch of final proposal. 152–153. The completed project by Lucio Costa, Oscar Niemeyer, Afonso Reidy, Carlos Leao, George Moreira, and Ernani Vasconcelos, architects; Le Corbusier, consultant.

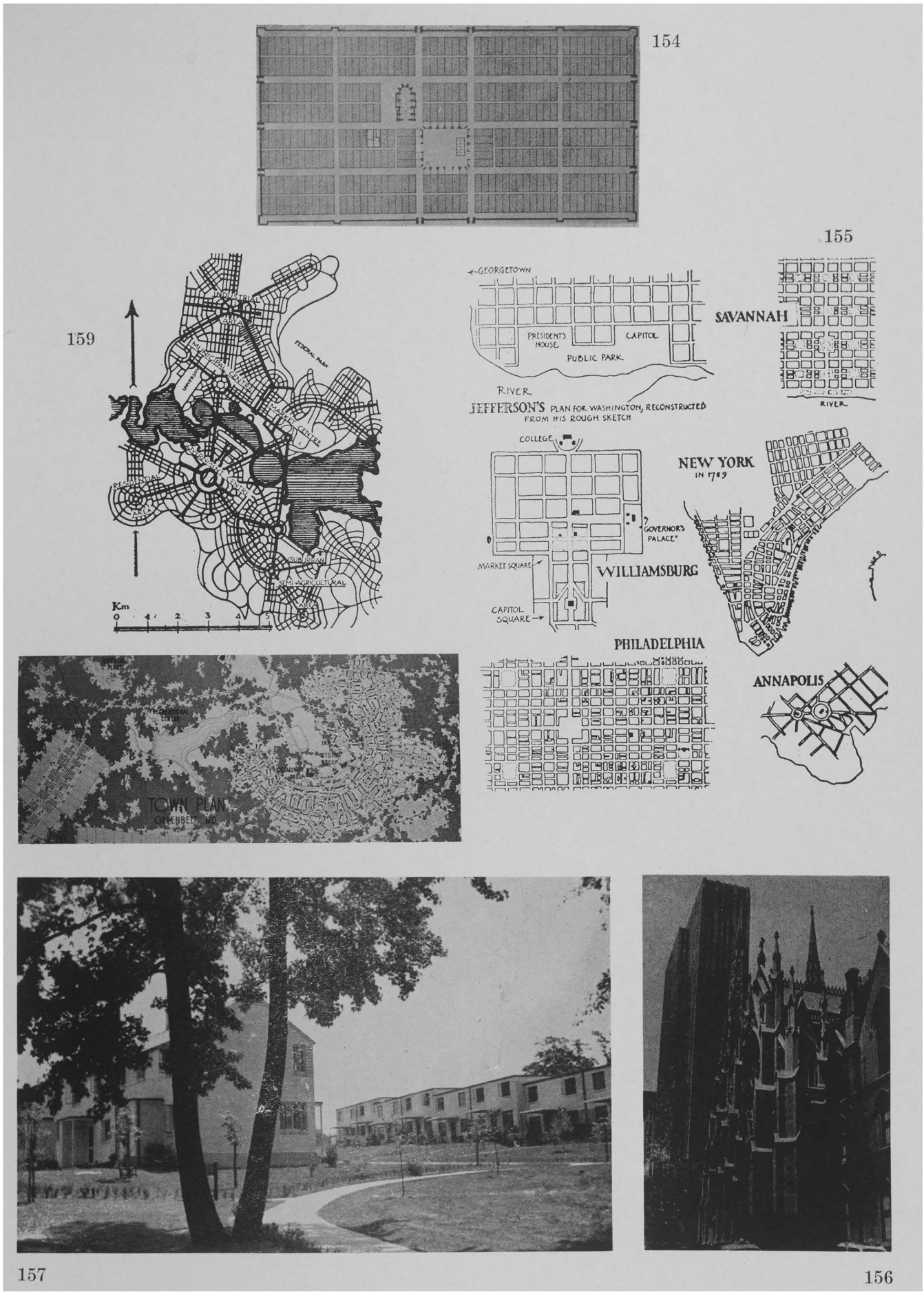


PLATE 37

(Left to right)

154. Montpazier. Twelfth century. 155. American Colonial town planning. 156. Radio City, New York. 157–158. Greenbelt, Maryland. 159. Canberra, capital city of Australia.

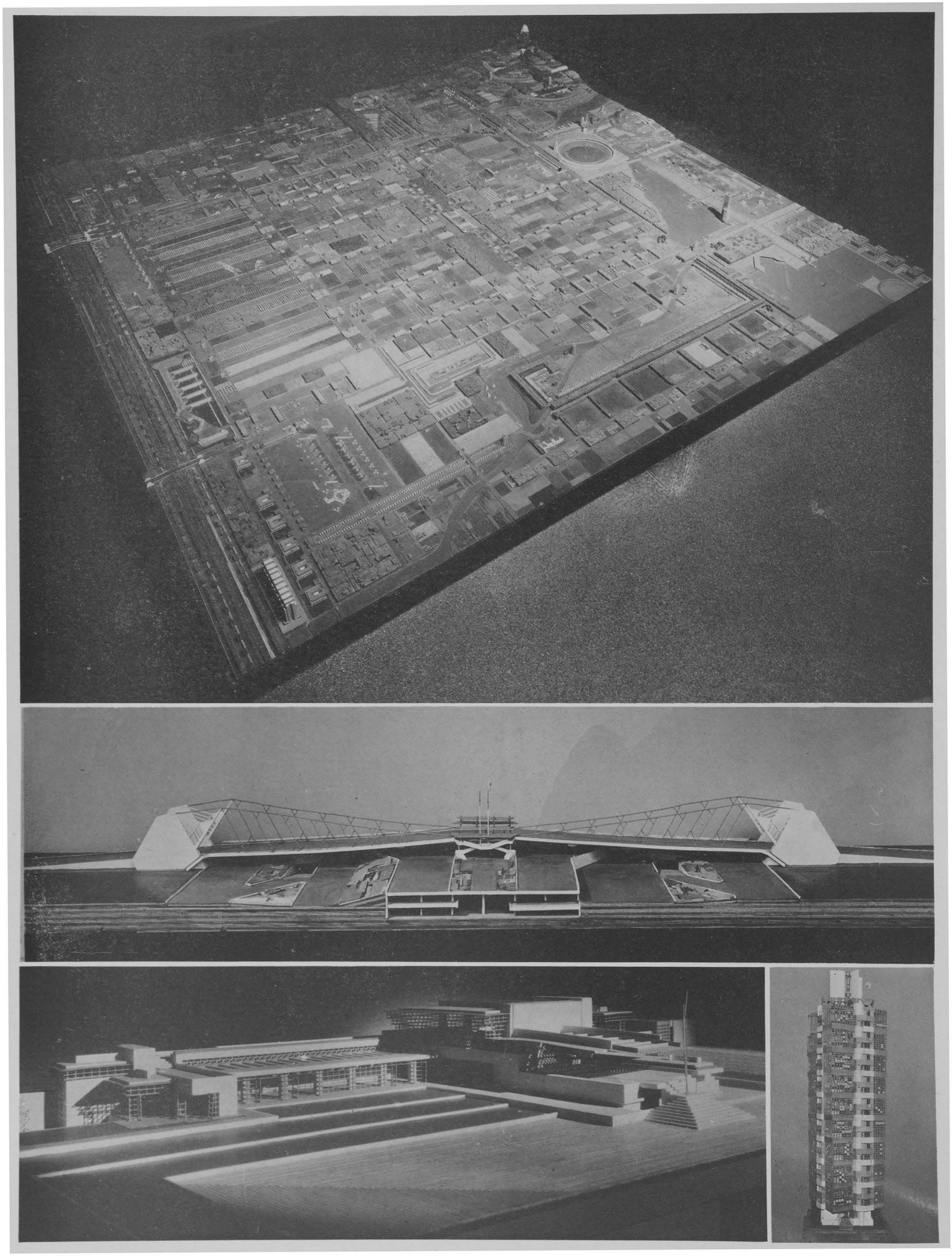


PLATE 38

(Left to right)

Frank Lloyd Wright: 160. Model of Broadacre City. 161. Model of highway intersection (Broadacre City). 162. House on the Mesa Model. 163. St. Mark's Tower (Broadacre City).

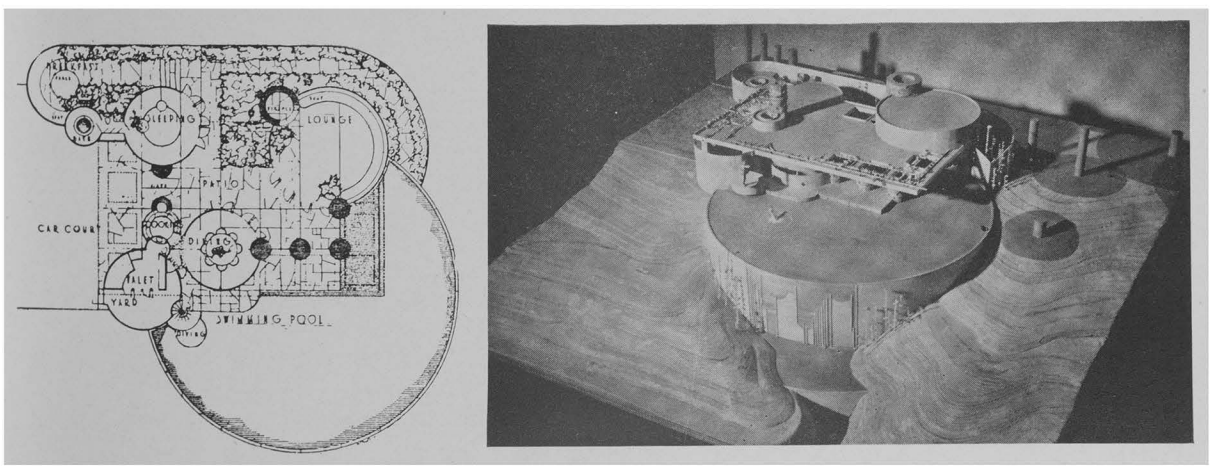
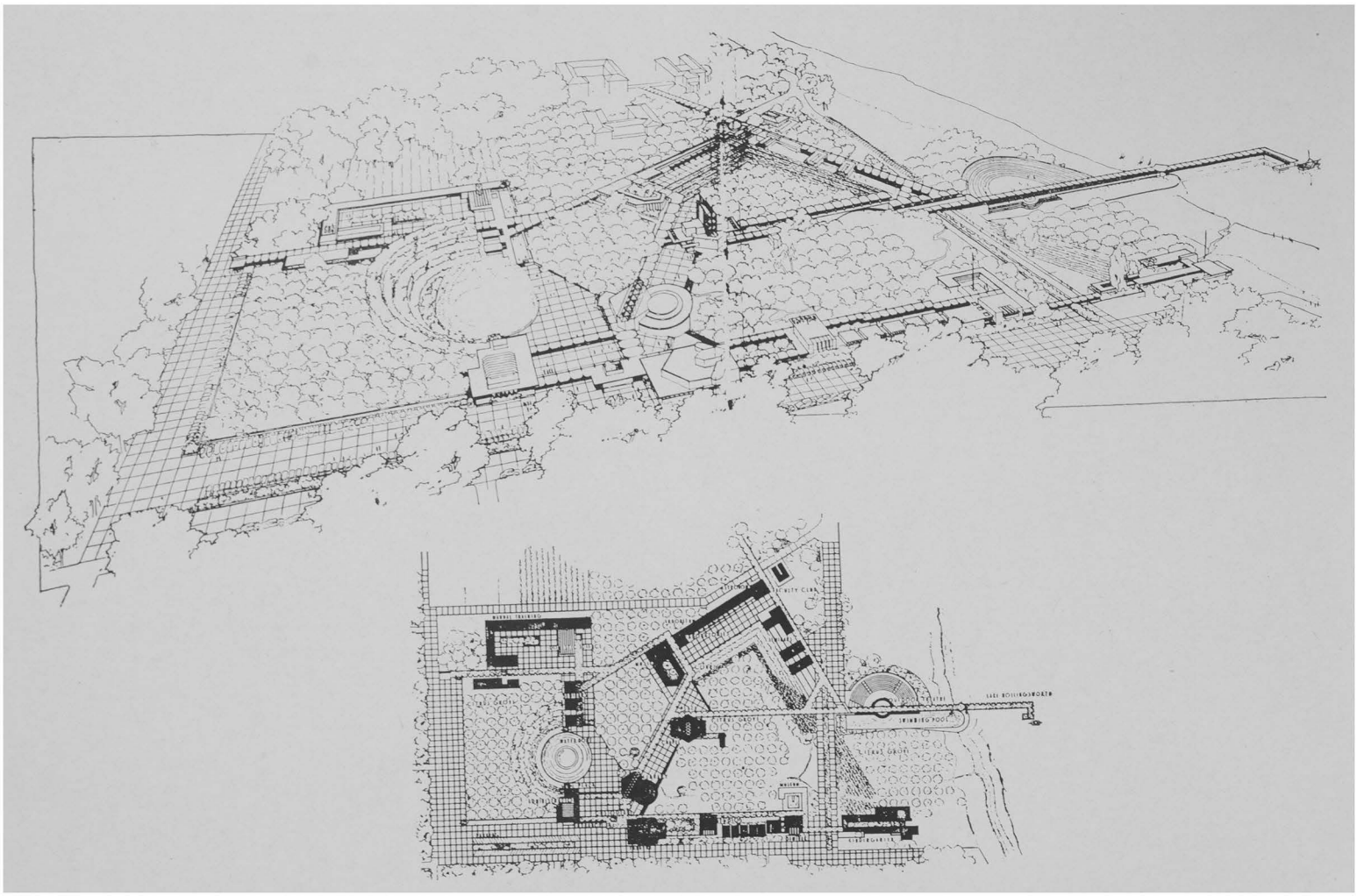


PLATE 39

(Left to right)

Frank Lloyd Wright: 164. Edgar J. Kaufman House. View from below waterfall. 165–166. Model of Project, Ralph Jesten (Martin J. Pence) House, Palos Verdes, California.



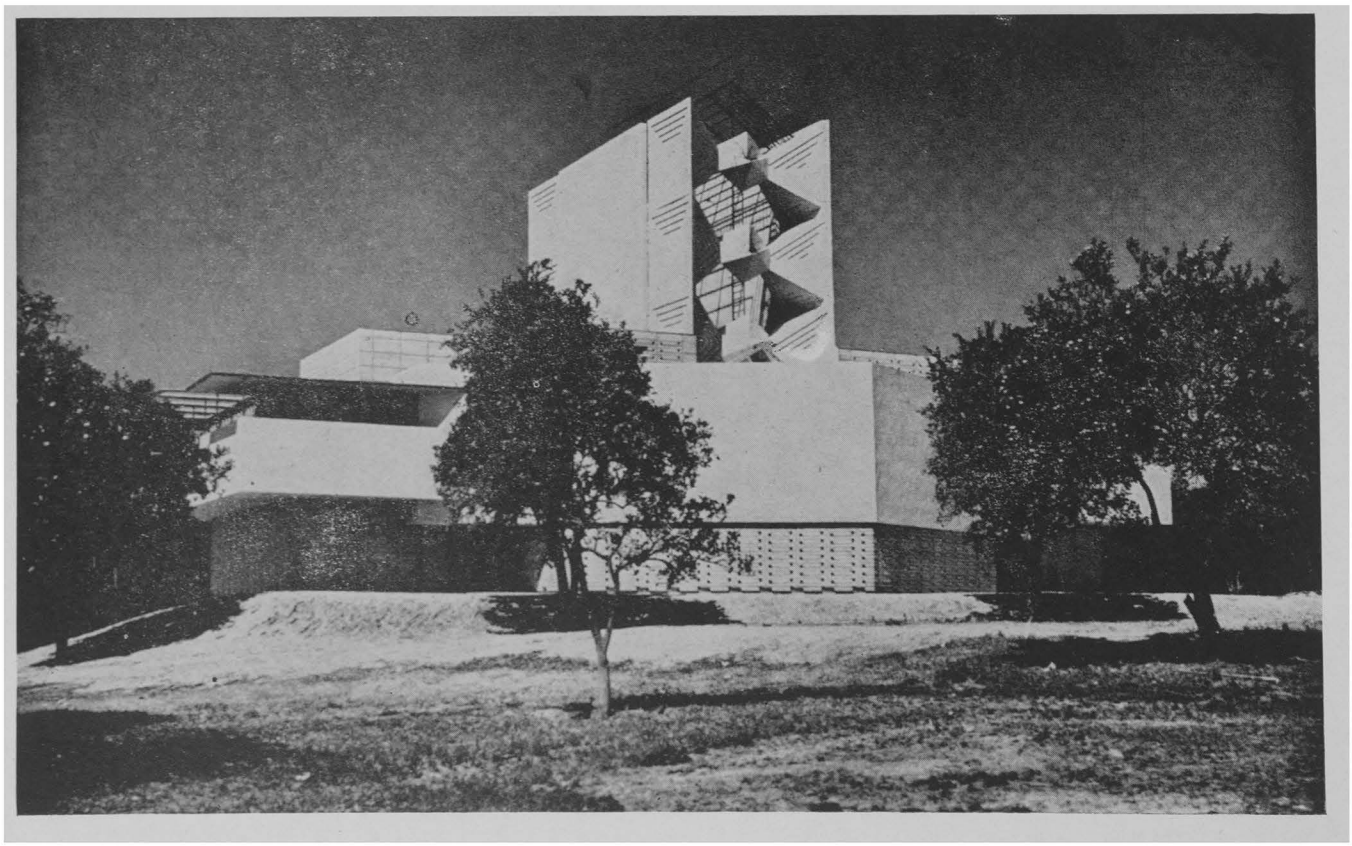


PLATE 40

(Left to right)

Florida Southern College, Lakeland, Fla., Project 1938; Construction 1940, by Frank Lloyd Wright: 167. Perspective Drawing of general layout. 168. General layout plan. 169. Ann Pfeiffer Chapel.